

Georgia State University
ScholarWorks @ Georgia State University

Kinesiology Dissertations

Department of Kinesiology and Health

Fall 1-5-2018

Self-Compassion and Healthy Behavior Regulation

David Biber

Follow this and additional works at: https://scholarworks.gsu.edu/kin_health_diss

Recommended Citation

Biber, David, "Self-Compassion and Healthy Behavior Regulation." Dissertation, Georgia State University, 2018.
https://scholarworks.gsu.edu/kin_health_diss/21

This Dissertation is brought to you for free and open access by the Department of Kinesiology and Health at ScholarWorks @ Georgia State University. It has been accepted for inclusion in Kinesiology Dissertations by an authorized administrator of ScholarWorks @ Georgia State University. For more information, please contact scholarworks@gsu.edu.

ACCEPTANCE

This dissertation, Self-Compassion and Healthy Behavior Regulation, by David Biber, was prepared under the direction of the candidate's Dissertation Advisory Committee. It is accepted by the committee members in partial fulfillment of the requirements for the degree, Doctor of Philosophy, in the College of Education and Human Development, Georgia State University.

The Dissertation Advisory Committee and the student's Department Chairperson, as representatives of the faculty, certify that this dissertation has met all standards of excellence and scholarship as determined by the faculty.

Rebecca Ellis, PhD
Committee Chair

Jane Brack, PhD
Committee Member

Walt Thompson, PhD
Committee Member

Ken Rice, PhD
Committee Member

Date

Mark Geil, PhD
Chairperson, Department of Kinesiology and Health

Paul A. Alberto, PhD
Dean
College of Education
and Human Development

AUTHOR'S STATEMENT

By presenting this dissertation as a partial fulfillment of the requirements for the advanced degree from Georgia State University, I agree that the library of Georgia State University shall make it available for inspection and circulation in accordance with its regulations governing materials of this type. I agree that permission to quote, to copy from, or to publish this dissertation may be granted by the professor under whose direction it was written, by the College of Education and Human Development's Director of Graduate Studies, or by me. Such quoting, copying, or publishing must be solely for scholarly purposes and will not involve potential financial gain. It is understood that any copying from or publication of this dissertation which involves potential financial gain will not be allowed without my written permission.

Name

NOTICE TO BORROWERS

All dissertations deposited in the Georgia State University library must be used in accordance with the stipulations prescribed by the author in the preceding statement. The author of this dissertation is:

David Dunkin Biber II
Kinesiology and Health
College of Education and Human Development
Georgia State University

The director of this dissertation is:

Dr. Rebecca Ellis
Department of Kinesiology and Health
College of Education and Human Development
Georgia State University
Atlanta, GA 30303

CURRICULUM VITAE

David D. Biber

ADDRESS: 869 Charles Allen Dr. NE, APT 3
Atlanta, GA 30308

EDUCATION:

Ph.D.	2017	Georgia State University Kinesiology and Health
Masters Degree	2013	Georgia Southern University Health and Kinesiology
Bachelors Degree	2011	Indiana University Psychology

PROFESSIONAL EXPERIENCE:

2013-present	GTA/GRA Georgia State University
2012-13	Behavior Coach/Group Therapist Wellspring
2011-2013	GTA/GRA Georgia Southern University

PRESENTATIONS AND PUBLICATIONS:

Biber, D. D. & Ellis, R. (2017). Validation of Self-Report MapMyRun Physical Activity Mobile Application. Abstract submitted for presentation at the Southeast American College of Sport Medicine Regional Conference

Biber, D. D., & Ellis, R. (2017). The effect of self-compassion on the self-regulation of health behaviors: A systematic review. *Journal of Health Psychology*. 1-12.

Biber, D. D. & Ellis, R. (2016). A RE-AIM evaluation of a team-based physical activity program for university employees. *International Journal of Sport Studies* 6(2), 90-94.

- Biber, D. D., & Ellis, S.** (2015, April). A RE-AIM analysis of D2M. Paper presented at the Kinesiology Research Symposium at Georgia State University.
- Biber, D. D.** (2015, February). *Motivational correlates of physical activity among university employees*. Poster accepted for presentation at the Southeast American College of Sport Medicine Regional Conference
- Cronon, H., **Biber, D. D., & Czech, D. R.** (2015). Understanding college females' intrinsic motives for physical activity: A qualitative comparison between athletes and non-athletes. *Journal of SPORT, 4*(2), 27-42.
- Pecinovsky, C., Harris, B.S., Czech, D.R., Burdette, T., & **Biber, D. D.** (2015). NCAA Division I head coaches' experiences with eating disorders and disordered eating in female athletes: A qualitative analysis. *Georgia Association for Health, Physical Education, Recreation and Dance, 47*(1), 21-32.
- Egli, T., Czech, D. R., Shaver, G., Gentner, N., Todd., G., & **Biber, D. D.** (2014). The experience of Christian prayer in coaching: A qualitative investigation. *Journal of Psychology and Christianity, 33*(1), 45.
- Biber, D. D.,** Czech, D. R., Harris, B. S., & Melton, B. (2013). Attraction to physical activity of generation Z: A mixed methodological approach. *Open Journal of Preventive Medicine, 3*, 310-319.
- Swainston, S., Gentner, N., **Biber, D. D.,** Czech, D. R., Joyner, B., & Easton, L. E. (2012). The effect of PETTLEP imagery in a pre-shot routine on full swing golf shot accuracy: A single subject design. *International Journal of Golf Science, 1, 2*, 140-163.

PROFESSIONAL SOCIETIES AND ORGANIZATIONS

2016

Southeast ACSM

2015

AASP

Self-Compassion and Healthy Behavior Regulation

by

David Biber

Under the Direction of Dr. Rebecca Ellis

ABSTRACT

Although self-compassion has a positive effect on the regulation of health-related behaviors (see Chapter 2; Biber & Ellis, 2017), further research is needed to examine the impact on physical activity (PA). Therefore, the purpose of this study was to test the effects of a theory of planned behavior (TPB) workplace intervention on self-compassion, physical activity (PA) motivation, and PA behavior among university employees. Participants ($n = 20$) were employees (80% female) from 11 Georgia State University departments that participated in the fourth annual Desire2Move (D2M) competition. Volunteers were assigned to either a self-compassion treatment group or an attention control group. Participants in both groups logged their PA using the *MapMyRun* website or smartphone application and received weekly tips and reminders. Treatment group participants also completed a seven-week self-compassion intervention beginning the second week of D2M. Self-reported self-compassion, TPB constructs, and PA behavior were collected pre- and post-intervention. Separate one-way ANOVAs with Bonferroni correction were used to determine group differences for weekly and total PA minutes (*MapMyRun*) between the

treatment and attention control groups during D2M. Separate repeated measures mixed ANOVAs with Bonferroni correction were also used to analyze changes in self-compassion, TPB constructs, and PA from pre- to post-intervention between the groups. There were no significant differences between the treatment and attention control groups for changes in self-compassion, TPB constructs, or self-reported PA from pre- to post-intervention or for minutes of PA during D2M. This was the first study to test the impact of self-compassion training on the regulation of PA. Participants listened to more than 62% of the treatment, which is higher adherence than previous mindfulness interventions. However, the small sample size limited the statistical power and the generalizability of findings. Future researchers should recruit a larger, heterogeneous sample, test the impact of a shorter self-compassion intervention, and tailor the self-compassion intervention to PA motivation and behavior. Understanding the self-regulatory impact of self-compassion could help researchers tailor physical activity interventions to include self-compassion components that could improve maintenance of PA.

INDEX WORDS: Self-compassion, Self-regulation, Physical activity, Mindfulness

Self-Compassion and Healthy Behavior Regulation

by

David Biber

A Dissertation

Presented in Partial Fulfillment of Requirements for the

Degree of

Doctor of Philosophy

in

Kinesiology

in

Kinesiology and Health

in

the College of Education and Human Development

Georgia State University

Atlanta, GA

2017

Copyright by
David D. Biber
2017

DEDICATION

The work and effort required to complete this dissertation was only made possible because of the sacrifice offered by Jesus Christ on the cross. The ability to stay mindfully self-compassionate is a product of the ability to receive grace from the Holy Spirit that was exemplified by the Son of God. “Therefore, since we have been justified by faith, we have peace with God through our Lord Jesus Christ. Through him we have also obtained access by faith into this grace in which we stand, and we rejoice in hope of the glory of God” (ESV, Romans 5:1-2). The fellowship and prayer that has been created and offered through this process was modeled in Acts 2 by the first disciples of the Lord. I pray that this dedication fosters curiosity and a striving to know Jesus Christ in others. Such a relationship with Jesus Christ is what has allowed me to understand the impact of compassion for others and self-compassion for myself. Thanks be to God.

ACKNOWLEDGMENTS

I would like to thank Dr. Ellis. You cannot understand how appreciative I am of your guidance, enthusiasm, and patience throughout this process. You have offered me invaluable feedback, allowed me to pursue my interests in the field, and supported me as I learned to become more self-compassionate in my own pursuit of a Ph.D. You have helped me find the true joy in research and mentored me in a way that cannot be quantified!

I would also like to thank Dr. Brack. You introduced me to self-compassion and taught with an enthusiasm and intentionality that is rare. You instilled in me a belief and personal practice of self-care and self-regulation that has transformed how I view teaching, research, working with clients, and my personal pursuits. Thank you for encouraging and supporting me; your authentic love of connecting through mentorship and teaching has become the foundation for how I hope to impact and work with students.

Thank you, Dr. Rice, for your statistical knowledge and guidance. For the many times that I was confused or needed help, you offered your time and wisdom. Thank you, Dr. Thompson, for guiding me through the research process and your expertise in physical activity. I want to thank my committee for working well together and teamwork, for comprising for the benefit of my education, and helping to develop a self-compassion intervention for physical activity when it had not been done before.

I would like to thank my family! You have all supported me so well over the past four years. Thank you for providing faith and allowed me to enjoy the process. Words cannot describe what you have done!

And to DC...

TABLE OF CONTENTS

LIST OF TABLES.....	iv
LIST OF FIGURES.....	v
1 The effect of self-compassion on the self-regulation of health behaviors: A systemic review	1
Methods.....	6
Results.....	7
Discussion.....	13
References	21
2 The effect of a mindful self-compassion intervention on university employee physical activity motivation and behavior	31
Methodology	35
Results	42
Conclusions	55
References	57
Appendices	64

LIST OF TABLES

Table 1. Characteristics of Included Studies.....	28
Table 2.1 Participant characteristics.....	44
Table 2.2 Scale Reliabilities and Correlations among Self-Compassion, TPB Constructs, and Physical Activity.....	45
Table 2.3 Self-Compassion Intervention Adherence.....	46
Table 2.4.....	48
Table 2.5.....	49

LIST OF FIGURES

Figure 1.1 Identification of Included Studies.....	30
Figure 2.1 Theory of Planned Behavior.....	32
Figure 2.2 Proposed Conceptual Framework.....	34
Figure 2.3 Diagram of flow of participants through data collection.....	43

1 THE EFFECT OF SELF-COMPASSION ON THE SELF-REGULATION OF HEALTH BEHAVIORS: A SYSTEMIC REVIEW

Physical inactivity has become a global problem over the past few decades. As of 2008, nearly 31% of people 15 years and older were not meeting physical activity guidelines (WHO, 2009). Furthermore, approximately 3.2 million people die each year from physical inactivity (WHO, 2009). Physical inactivity is associated with many chronic diseases including type 2 diabetes, breast cancer, colon cancer, high blood pressure, stroke, as well as difficulty maintaining a healthy weight and an increase in all-cause mortality (USDHHS, 2008; WHO, 2010). Physical inactivity is also negatively associated with multiple psychological factors such as dementia, cognitive impairment, and Alzheimer's (Reiner, Niermann, Jekauc, & Woll, 2013), and symptoms of depression and anxiety (USDHHS, 2008). However, decreasing inactivity by 10-25% could prevent between 533,000-1.3 million deaths each year, and increase the world's population life expectancy by 0.68 years (Lee et al., 2012).

One way to increase adult physical activity is through the implementation of interventions. Interventions are a systematic approach of targeting a given health behavior, like physical activity, with the goal of increasing that behavior (Marcus & Forsyth, 2003). For example, physical activity interventions effectively increase physical activity among adults (Conn, Hafdahl, Cooper, Brown, & Lusk, 2009; Dishman & Buckworth, 1996). The first meta-analysis to review physical activity interventions found a moderately strong effect ($r = .34$) on adult behavior across a variety of settings (Dishman & Buckworth, 1996). In a more recent review of 358 physical activity interventions, Conn, Hafdahl, and Mehr (2011) found they were moderately effective ($r = .19$) in increasing physical activity when compared to control groups ($r = .00$). More specifically,

Taylor, Conner, and Lawton (2012) found theory-based physical activity interventions ($r = .34$) produced significantly greater changes in physical activity compared to non-theory-based interventions ($r = .21$). Theory-based physical activity interventions also enable understanding of physical and psychological determinants that mediate behavior change (Brug, Oenema, & Ferreria, 2005). Understanding such factors can lead to the development of interventions that help individuals engage in short-term physical activity and achieve long-term physical activity maintenance (Painter, Borba, Hynes, Mays, & Glanz, 2008).

One theoretical framework that explains physical activity adoption and maintenance is self-regulation (Baumeister & Heatherton, 1996; Carver & Scheier, 1981). Behavioral self-regulation refers to people's ability to engage in and adhere to behaviors that promote health and well-being (Carver & Scheier, 2001). Self-regulation generally includes a process loop of setting goals, goal-directed behavior, monitoring, and adjusting behavior (Baumeister & Heatherton, 1996; Carver & Scheier, 1981). The first step of behavioral self-regulation is goal-setting. For example, someone may set the goal of engaging in 150 minutes of moderate-to vigorous-physical activity each week. Such a goal provides a reference point for improvement or success. If individuals do not set goals, they have nothing towards which to work. Also, if health-related goals are unrealistic or personally unimportant, regulation of behavior towards these goals will be hindered (Baumeister & Heatherton, 1996). The second component of behavioral self-regulation is engaging in goal-directed behavior. This could include engaging in physical activity and adhering to regular physical activity over time. Without proper goals, actual behavioral engagement will be limited or non-existent. The third step of behavioral self-regulation is monitoring progress towards goals. This includes keeping track of actions and psychological states (Baumeister & Heatherton, 1996). For example, an exerciser could keep a log of their daily physical activity and

how they felt during such activity. When an individual ceases to track or monitor such behavior, they tend to lose control. Failure to monitor behavior can also lead to misinterpretation or judgment of one's abilities regarding healthy behavior. The last step in the self-regulation loop is adjusting goals or behavior. For example, if an individual fails to engage in 150 minutes of physical activity in a week, they may need to adjust their goal to 120 minutes of physical activity, or adjust the modes of physical activity they were attempting. Overall, the process of self-regulation is a form of control over goals and behavior.

Oftentimes, individuals fail to regulate health behaviors due to underregulation or misregulation (Carver & Scheier, 1981). Underregulation is the inability to exert self-control. For example, an overweight and sedentary individual who does not engage in any physical activity is engaging in underregulation. Misregulation occurs when an individual exerts self-control, but in a counterproductive or harmful manner. An overweight individual who logs their food intake, with no intention of eating healthy, may be misregulating their dietary behavior. In regard to physical activity, a sedentary adult may set the goal of exercising seven days per week. Changing from zero to seven days of physical activity per week is unrealistic and unlikely for most people. As with the example, misregulation is often the result of setting inappropriate or unrealistic health behavior goals (Baumeister & Heatherton, 1996). Unfortunately, self-regulation is a limited resource (Baumeister & Heatherton, 1996). For example, a thermostat is programmed to keep a house at a certain temperature. If an individual is cold, they may increase the thermostat from 68 to 70 degrees (goal-setting). The thermostat then works to increase the temperature of the house (behavior). Monitoring of the temperature continues as temperature decreases or increases above or below the set point of 70 degrees (Burnette, O'Boyle, VanEpps, & Pollack, 2012), but certain temperatures cannot be maintained forever, as self-regulatory resources begin to decrease. The same

is true for self-regulation of health behaviors. However, if self-regulatory resources could be enhanced or become less essential for health behaviors like physical activity, resultant engagement in physical activity may be more realistic and probable. Therefore, an intervention strategy that may assist individuals with self-regulation of health behaviors by preserving self-regulatory resources is self-compassion.

Self-compassion is a way of understanding and engaging towards oneself that is grounded in Buddhism (Kabatt-Zinn, 1994). The clarity of thought enhanced by mindfulness is incorporated into self-compassion to improve self-love and potential complacency of behaviors (Neff, 2003a). More specifically, self-compassion is viewed as the ability to treat oneself with the same kindness and compassion as one would treat others in the same situation (Neff, 2003a). Self-compassion involves three constructs: self-kindness vs. self-judgment, common humanity vs. isolation, and mindfulness vs. over-identification (Neff, 2003a). Common humanity involves viewing an experience as common to other people and part of a larger human experience, rather than isolating and individual in nature. This sense of common humanity recognizes that all humans are imperfect and experience failure. Self-kindness entails understanding towards oneself rather than judgment and self-criticism. It allows an individual to view their failure in a broad perspective in connection with the sense of common humanity. Mindfulness requires a balanced awareness of thoughts and experiences, rather than over-identifying with them (Neff, 2003b). With mindfulness, an individual can be aware of suffering so they can extend self-compassion to themselves (Neff, 2003b). For example, a self-compassionate individual who missed a scheduled day of exercise may view this experience in a forgiving and kind manner, a common occurrence that others struggle with; understanding tomorrow is a new day.

Neff and colleagues have empirically studied self-compassion since 2003, and discovered it is associated with many psychological benefits. Self-compassion is positively correlated with positive affect (Learly et al., 2007; Neff & Vonk, 2009), well-being (Neely, Schallert, Mohammed, Roberts, & Chen, 2009), and life satisfaction and emotion focused coping (Neff et al., 2005), and negatively correlated with anxiety and depression (Neff, 2003a; Neff et al., 2007a). In response to these positive findings, Neff and Germer (2013) developed an eight-week self-compassion intervention to empirically test whether self-compassion can be improved. Their mindful self-compassion intervention (MSC) teaches formal and informal meditation and self-compassion, self-kindness, reduction of emotional distress, and self-judgment. When compared with a control group, the 8-week MSC program enhanced self-compassion, mindfulness, and wellbeing (Neff & Germer, 2013). In addition, a modification of this eight-week intervention to a three-week podcast format was implemented by Smeets, Neff, Alberts, and Peters (2014). With 52 students, the self-compassion intervention led to significantly greater increases in self-compassion, mindfulness, optimism, and self-efficacy, and significantly greater decreases in rumination in comparison to the active control intervention. These findings demonstrated that a brief, self-led self-compassion podcast intervention effectively increased self-compassion and resilience. Altogether, both interventions indicated the efficacy of self-compassion for improving psychological health and the need to determine its efficacy for behavior change.

Overall, adults engage in insufficient amounts of physical activity that are required to achieve health benefits (WHO, 2009). Low levels of physical activity may be the result of misregulation or underregulation as explained by the self-regulation framework (Carver & Scheier, 1981). Given the difficulties individuals experience with self-regulation, self-compassion interventions could be beneficial for individuals who are self-critical or harsh towards themselves in regard to

healthy behavior regulation. Therefore, the purpose of this literature review was to systematically review the published research on the effect of self-compassion interventions on health behaviors.

Methods

A search for literature relevant to the research purpose was conducted within GoogleScholar, PubMed, and EbscoHost (PsychINFO and SPORTDiscus) up to March 2016. Selfcompassion.org was also searched as a secondary source. The search used combinations of the following keywords: *self-regulation*, *exercise*, *physical activity*, *self-compassion*, *mindful self-compassion (MSC)*, *compassionate mind training (CMT)*, *compassion focused therapy (CFT)*, *health behavior*, *diet*, *weight loss*, and *smoking*. Articles were included if they met the following criteria: (a) peer-reviewed, (b) written in English, (c) published between 1981 and 2015, (d) included self-regulation as an intervention, and (e) the primary outcome variable was a measurable health behavior such as smoking cessation, eating/diet intake and monitoring, physical activity behavior and monitoring, and eating disorder symptomology and behavior. A self-regulation intervention was defined as participants engaged in goal-setting behavior, goal-directed behavior, monitoring, and/or adjusting health behavior (Baumeister & Heatherton, 1996; Carver & Scheier, 1981). For example, if an intervention required participants to monitor and regulate food intake, self-regulation occurred. However, interventions that required participants to only record weight-loss was not considered self-regulation. The publication dates were based on the seminal self-regulation article published in 1981 by Carver and Scheier. Articles were excluded if they measured self-compassion, but did not include measurement of health behavior.

Results

The searches identified 445 articles (PubMed = 249, GoogleScholar = 149, EbscoHost = 47). Duplicate articles and articles not meeting the inclusion criteria were removed, resulting in a final sample of seven articles for the review (see Figure 1.1; PubMed using keywords *self-compassion*, *health behavior*, and *CFT* = three; EbscoHost using keywords *self-compassion* and *health behavior* = two; EbscoHost using keywords *self-compassion* and *smoking* = one; GoogleScholar using keywords *self-compassion* and *health behavior* = one). Table 1 provides a summary of the articles included within the review.

Participant Characteristics

The total number of participants in the seven studies was 553 ($M = 79$, $SD = 31.4$, $Mdn = 84$). The smallest sample size was 41 (Kelly & Carter, 2014) and the largest sample size was 126 (Kelly, Zuroff, Foa, & Gilbert, 2010). The targeted populations included individuals with eating disorders/disordered eating ($n = 4$; Adams & Leary, 2007; Gale, Gilbert, Read, & Goss, 2014; Kelly, Carter, & Borairi, 2014; Kelly & Carter, 2014), medical students ($n = 1$; Greeson, Toohey, & Pearce, 2015), smokers ($n = 1$; Kelly et al., 2010), and individuals attempting to lose weight ($n = 1$; Tapper, Shaw, Ilsley, Hill, Bond, & Moore, 2009).

Only five of the seven studies reported participant age ($M = 33.9$, $SD = 10.7$, $Mdn = 28.0$). The youngest average participant age was 24.4 years (Kelly et al., 2010) and the oldest average participant age was 45 (Kelly & Carter, 2014). Females represented 82.5% of the participants across the seven studies. Three studies included samples that were at least 95% female (Adams & Leary, 2007; Gale et al., 2014; Kelly et al., 2014); however, none of the studies had a sample with a majority representation of male participants. Only three of the seven studies reported information about race/ethnicity (Kelly & Carter, 2014; Kelly et al., 2014; Kelly et al., 2010) and those samples included mostly White or Caucasian participants (76.9%), followed by Hispanic

(7.5%), and Mixed Race (4.6%). Finally, three studies reported Body Mass Index (BMI) information ($M = 25.4$, $SD = 5.4$; Adams & Leary, 2007; Kelly et al., 2014; Tapper et al., 2009).

Intervention Components

The seven self-compassion interventions were conducted over various durations ($M = 5.2$ weeks, $Mdn = 3$ weeks, Range = 1 day – 12 weeks). The majority of the self-compassion intervention durations were relatively short (≤ 1 month) and included one day ($n = 1$, Adams & Leary, 2007), three weeks ($n = 3$, Kelly & Carter, 2014; Kelly et al., 2010; Tapper et al., 2009), and four weeks ($n = 1$, Gale et al., 2014). Longer durations (2-3 months) included eleven weeks ($n = 1$, Greeson et al., 2015) and twelve weeks ($n = 1$, Kelly et al., 2014). Only four studies reported attrition rates ($M = 17.9$, Gale et al., 2014; Kelly & Carter, 2014; Kelly et al., 2010; Tapper et al., 2009). The 12-week intervention reported the highest attrition rate (22%; Gale et al., 2014) and the lowest attrition rate was for a 3-week intervention (14.6%; Kelly & Carter, 2014). Finally, none of the included studies conducted follow-ups to assess the long-term impact of the intervention on behavioral self-regulation.

Five of the seven studies included in the review were theory-based (Adams & Leary, 2007; Gale et al., 2014; Kelly & Carter, 2014; Kelly et al., 2014; Kelly et al., 2010). Two studies used the self-regulation theory (Adams & Leary, 2007; Kelly et al., 2010). Specifically, goal setting, self-monitoring, and behavioral adjustment were included in the interventions. The three other theory-based studies used CFT theory (Gale et al., 2014; Kelly & Carter, 2014; Kelly et al., 2014). These studies specifically targeted affiliated emotions often associated with behavior and adjusting such emotions. These studies also included components of cognitive-behavioral therapy because participants were concurrently admitted into traditional eating-disorder treatment programs.

The two remaining studies did not report using any theory to guide their intervention (Greeson et al., 2015; Tapper et al., 2009). One study included components of CFT like emotional associations with food and resultant behavior; however, they did not explicitly state the study was grounded in such theory (Tapper et al., 2009). The last study included components of self-regulation theory like teaching healthy behaviors, adjusting behavior, and enhancing self-care behaviors without mentioning this theory (Greeson et al., 2015).

Various types of self-compassion interventions were used in the seven studies. Four of the included studies used some variation of CFT (Adams & Leary, 2007; Gale et al., 2014; Kelly et al., 2014; Kelly & Carter, 2014). Adams and Leary (2007), Gale et al. (2014), and Kelly et al. (2014) incorporated similar CFT programs that focused on emotional regulation strategies; understanding personal self-criticism, shame and pride; development of motivation and emotion toward oneself and others; understanding fears and barriers to developing self-compassion; and developing overall self-compassion using a variety of interventions including compassionate imagery, thinking, emotions, and behavior (Gilbert & Procter, 2006); whereas, Kelly and Carter (2014) used a different form of CFT to target self-compassion. This intervention used a PowerPoint to teach self-compassion and reduce anxiety, blame, self-criticism, shame, and guilt. Participants were asked to write themselves a self-compassionate letter for a time of struggle and use imagery and self-talk to cultivate self-compassion (Goss, 2011; Goss & Allan, 2011, 2014).

The remaining three studies used different types of self-compassion interventions. One intervention used a self-compassion PowerPoint in association with compassionate mind training ($n = 1$; Kelly et al., 2010). The intervention focused on self-compassionate imagery and the creation of the ideal self-compassionate self (Gilbert & Irons, 2005). Another type of intervention used was acceptance commitment therapy (ACT) to improve self-compassion ($n = 1$, Tapper et al.,

2009). The intervention focused on improving personal health values, enhancing motivation, cognitive diffusion, and having compassion and tolerance towards personal negative feelings, and to help reduce the link between food- and exercise-related thoughts and behavior (Hayes & Smith, 2005). The final study used a self-care and skill building workshop as a means of improving self-compassion and self-regulation of behavior ($n = 1$; Greeson et al., 2015). The objectives of this intervention were to reduce perceived stress, increase mindfulness in a non-judgmental manner, and provide support and improvement of self-care and health behaviors (Saunders et al., 2007).

Assessment of Health Behaviors

The seven included interventions targeted self-regulation of five different health behaviors. Three of the interventions targeted eating disorder symptomology (Gale et al., 2014; Kelly & Carter, 2014; Kelly et al., 2014). Self-compassion was used to decrease the number of eating disorder signs and symptoms over the course of treatment. Another one of the interventions targeted over-eating in restrictive and guilty eaters (Adams & Leary 2007). One intervention used self-compassion to attenuate smoking behavior (Kelly et al., 2010). Although the goal of another self-compassion intervention was weight loss, participants self-regulated physical activity behavior throughout the intervention (Tapper et al., 2009). The last intervention was designed to improve overall self-care behaviors such as sleep and exercise (Greeson et al., 2015).

All of the interventions used self-report measures to assess a change in health behavior. Five of the interventions measured behavior using valid and reliable questionnaires (Adams & Leary, 2007; Gale et al., 2014; Kelly & Carter, 2014; Kelly et al., 2014; Tapper et al., 2009). Of these, three assessed the frequency of eating disorder behaviors and severity of symptoms over the past 28 days with the Eating Disorder Examination Questionnaire (EDE-Q; see Fairburn & Beglin,

1994; Gale et al., 2014; Kelly & Carter, 2014; Kelly et al., 2014). In addition to weighing eaten food (i.e., grams), the Revised Rigid Restraint Scale (RRRS; Herman & Polivy, 2004) measured effort to avoid eating unhealthy or “forbidden foods” (Adams & Leary, 2007). Finally, the Brief Physical Assessment Tool (BPAT; Smith, Marshal, & Huang, 2005) measured the frequency of 30 minute bouts of moderate intensity physical activity, the frequency of 30 minute bouts of walking, and the frequency of 20 minute bouts of vigorous physical activity performed during the past week (Tapper et al., 2009). Two of the interventions did not use valid and reliable questionnaires (Kelly et al., 2010; Greeson et al., 2015). Participants self-reported the number of cigarettes smoked per day (Kelly et al., 2010) and perceived improvement of self-care behaviors was measured by five open-ended questions created by the researchers (Greeson et al., 2015).

Intervention Design and Treatment Effectiveness

Four of the seven studies were randomized controlled trials (RCTs; Adams & Leary, 2007; Kelly & Carter, 2014; Kelly et al., 2010; Tapper et al., 2009). The most common type of design included a three-group RCT (Adams & Leary, 2007; Kelly & Carter, 2014), followed by a four group RCT (Kelly et al., 2010) and two group RCT (Tapper et al., 2009). Two of the RCTs targeted eating behavior (Adams & Leary, 2007; Kelly & Carter, 2014), and the other two targeted cigarette smoking behavior (Kelly et al., 2010) and physical activity (Tapper et al., 2009). Three of the RCTs used traditional control groups (Adams & Leary, 2007; Kelly et al., 2010; Tapper et al., 2009), and one RCT used a wait-list control group design (Kelly & Carter, 2014).

All four of the self-compassion RCTs significantly improved self-regulation of health behaviors compared to the respective control groups (Adams & Leary, 2007; Kelly & Carter, 2014; Kelly et al., 2010; Tapper et al., 2009). In addition, results from the RCTs that included more

than two groups (i.e., self-compassion group, behavioral group(s), control group), the self-compassion interventions were at least as effective as the other types of behavioral interventions (Adams & Leary, 2007; Kelly & Carter, 2014; Kelly et al., 2010). For instance, over a three week period, the self-compassion intervention reduced cigarettes per day to the same degree as two other imagery-based self-talk interventions (Kelly et al., 2010). Adams and Leary (2007) reported a significant interaction in which a self-compassion pre-load food condition was at least as effective at reducing eating behavior over time as the non-self-compassion pre-load food condition. Lastly, a self-compassion intervention was equally effective as a behavioral-replacement intervention in reducing weekly binge eating episodes and weekly binge days over a 12-week period (Kelly & Carter, 2014).

In addition to RCTs, two studies used a single-group repeated measures design to assess the impact of CFT in conjunction with traditional psycho-educational therapy treatment on eating disorders (Gale et al., 2014; Kelly et al., 2014). Both of these studies reported significant improvements in eating disorder symptomology following the respective 12-week (Kelly et al., 2014) and 16-week (Gale et al., 2014) interventions. Finally, one qualitative study indicated self-compassion increased self-care behaviors such as exercise, sleep, and engaging in social support (Greeson et al., 2015). Overall, 100% of the self-compassion interventions included in this review reported significant improvements in health behavior.

Discussion

The purpose of this review was to examine the effect of self-compassion interventions on health behaviors. After an extensive search through a combination of databases, seven studies met all inclusion criteria. The findings from the seven studies indicated a positive impact of self-compassion on self-regulation of health behaviors including eating disorder symptomology, over

eating, physical activity associated with weight loss, smoking cessation, and self-care behaviors like sleep and exercise. In addition to evaluating the effectiveness of self-compassion interventions for health behavior regulation, the current review provided information about participant characteristics (i.e., age, gender, race), intervention components (i.e., duration, attrition rates, theory-based content, types of self-compassion interventions), and behavioral assessment to better inform future research.

All seven of the self-compassion interventions were effective at improving self-regulation of health behavior regardless of study design. Four of the seven interventions were RCTs and they are the preferred method of assessing effectiveness of a health-behavior intervention (Rothwell, 2005). Results from the RCTs indicated the self-compassion interventions significantly improved health behavior compared to control groups. However, it is difficult to assess external validity, or the extent to which the results from RCTs generalize to a definable population outside of the research study (Rothwell, 2005). Depending on the health behavior, participants may not want their treatment to be chosen at random. Although the interventions included in this review revealed statistically significant results when comparing treatment to control, the results are less conclusive when comparing self-compassion groups to the other experimental condition groups within each intervention. The effectiveness of self-compassion on health behavior is less clear because self-compassion was paired with psycho-educational therapy and did not include a control group. In addition, none of the included studies used the exact same self-compassion intervention, which is needed to determine if self-compassion alone is effective at improving self-regulation of health behaviors. Efficacy of RCT or non-RCT may depend on patient preferences of treatment and type of behavior being targeted (Group, 2008; Rothwell, 2005). Moreover, because the included studies targeted a range of health behaviors, it is difficult to determine whether or

how study design impacted results. However, RCTs remain the preferred study design, especially if the treatment is not for psychological or pharmacological reasons like eating disorders, depression, bipolar, schizophrenia, etc. (McHugh, Whitton, Peckham, Welge, & Otto, 2013). Lastly, effectiveness of self-compassion interventions may be better determined if the intervention is not paired with other forms of treatment, as seen with the interventions targeting eating disorders symptoms.

Most of the self-compassion interventions were conducted with relatively young, female, White adults. Although all seven studies reported gender (95% female), only five reported age ($M = 33.9$ years), and three reported race (76.9% Caucasian/White). The results of the review indicated self-compassion interventions had a positive impact on self-regulation of health behaviors in these groups; however, the lack of diversity across the samples is a critical limitation of this research. Results of a recent meta-analysis indicated males have significantly higher self-compassion than females (Yarnell, Stafford, Neff, Reilly, Knox, & Mullarkey, 2015), but differences in how a self-compassion intervention influences levels of self-compassion and resulting health behavior regulation between genders have not been examined.

The average age of the participants in the included studies was relatively young ($M = 33.9$ years). Self-compassion has a positive psychological and behavioral impact on younger populations (Barnard & Curry, 2011; Neff, 2011); however, further intervention research needs to include a wider age range. Self-compassion is positively associated with aging successfully and negatively correlated with impairment (Allen, Goldwasser, & Leary, 2012). Common changes associated with aging such as loss of physical or mental functioning associated with activities of everyday living can lead to self-criticism (Mirowsky & Ross, 1992). Although self-compassion is positively correlated with positive aging and well-being, future researchers should

assess how a self-compassion intervention can improve health behaviors and reduce self-criticism associated with aging.

Future researchers should also target a racially diverse sample of adults to further the understanding of the impact of self-compassion on self-regulation of health behaviors. Previous research suggests that self-compassion does not differ between races in a college-aged sample (Lockard, Hayes, Neff, & Locke, 2014). However, minority races tend to engage in lower levels of various health promoting behaviors such as healthy eating, adequate sleep, and physical activity (Schoenborn, Adams, & Peregoy, 2013). Employing a self-compassion intervention with a racially diverse sample would help determine whether such an intervention is equally effective across races and substantiate research across a more representative sample.

The seven self-compassion interventions positively impacted self-regulation of health behaviors across varying durations, although the majority of the interventions (71.4%) were relatively short (i.e., ≤ 1 month/4 weeks) and they demonstrated the ability to retain participants. Only four of the studies reported attrition rates and not surprisingly, the 12-week intervention reported the highest attrition rate (22%; Gale et al., 2014). However, the average attrition rate across these four interventions (17.9%) was within the lower end of the range often seen in health behavior change interventions (7-84%; Linke, Gallo, & Norman, 2011; Maher, Lewis, Ferrar, Marshall, De Bourdeaudhuij, & Vandelandotte, 2014; Skelton & Beech, 2011). An 8-week MSC intervention was created and validated by Neff and Germer (2013) and it may help prevent attrition because it is four weeks shorter than the intervention with the highest level of attrition. Furthermore, although this intervention is associated with greater emotional regulation (Neff & Germer, 2013), its effect on self-regulation of health behavior has yet to be investigated. Finally,

it should be noted that none of the studies conducted follow-up assessments of the long-term impact of the interventions. Although short-term initiation and behavior change and regulation are critical, long-term change has important health implications. Therefore, future researchers should implement the 8-week MSC intervention to determine its efficacy for self-regulation of short- and long-term health behavior change.

Five of the seven interventions used a specific theoretical framework to guide the interventions. Previous meta-analytic reviews indicated theory-based interventions were more effective for promoting behavior change when compared to non-theory based interventions (Dishman & Buckworth, 1996; Prestwitch et al., 2014; Taylor et al., 2012; Webb, Joseph, Yardley, & Michie, 2010). However, the non-theory based interventions also improved self-regulation of health behavior. These studies contained intervention components that could be associated with various theories, but the theories were not identified by the authors. It is important for interventions to be theory-based and for researchers to explicitly state in the methods what theories and specific constructs the intervention is targeting. This will help determine the effectiveness of theory-based self-compassion interventions and the specific constructs that should be targeted to improve self-regulation of health behaviors (Prestwitch et al., 2014).

The theory-based interventions included in this review were also based on a single theory and effectively improved self-regulation of health behavior. This is consistent with previous research in which interventions based on a single theory had a greater impact on health behavior, specifically physical activity, when compared to interventions based on multiple theories (Gourlan et al., 2015). Future self-compassion interventions could be structured around the self-regulation theory because self-regulation has been hypothesized to impact health behavior change (Si-rois, 2015; Terry & Leary, 2013). A self-compassion intervention based upon the self-regulation

theory could also be used to specifically target other health behaviors not well-represented in the studies included in this review such as physical activity.

The interventions also differed in terms of the types of behavior change techniques included in the intervention. Although multiple behavior change techniques were implemented, each of the interventions significantly improved self-regulation of health behavior. Three of the included interventions used emotional regulation as a means of changing health behavior and they were equally effective as behavioral techniques (Adams & Leary, 2007; Gale et al., 2014; & Kelly et al., 2014). In a review of the impact of various intervention techniques on behavior regulation and change, emotional control training was the least effective when compared to promoting self-efficacy, communication skills training, and stress management (Webb et al., 2010). This is different from results of the current review in which self-compassion, a form of emotional control training, was an effective technique for improving health behavior. The interventions included in this review were theory-based, thus emotional regulation techniques may be more effective when theory-based. However, theory-based interventions that included multiple behavior change techniques were more effective for changing health behavior than interventions containing fewer techniques (Webb et al., 2010). It appears a theory-based intervention that combines self-compassion and behavior change techniques may be most effective at improving self-regulation of health behavior. Behavioral change techniques are most beneficial when implemented in accordance with specific theories, and future researchers should create interventions using theories and appropriate corresponding behavioral change techniques (Webb et al., 2010).

The interventions included in this review targeted a variety of health behaviors including eating disorder symptomology, over-eating, smoking, physical activity, and overall self-care behaviors. Results confirmed the efficacy of self-compassion for improving regulation of all these

health behaviors. The majority of the interventions also used valid and reliable self-report assessments to measure behavior. Valid measurements are necessary to assess and understand the impact of an intervention on behavior change in relation to theory (Rothwell, 2005). For certain behaviors like physical activity, direct monitoring is especially helpful since participants tend to over-report frequency of behavior (Prince et al., 2008). Future researchers should test the 8-week MSC intervention (Neff & Germer, 2013) to determine the effectiveness of a valid self-compassion intervention across various behaviors. Although it appears that self-compassion improves self-regulation of some health behaviors, it is important to substantiate such a claim with repeated studies across each health behavior. Follow-up assessments are necessary to determine the effectiveness of self-compassion on long-term behavior regulation and maintenance. Less clinical behaviors, such as physical activity adoption and maintenance need to be targeted as well. Physical activity is an important health behavior that was only targeted in one of the interventions, but not assessed for follow-up effectiveness (Tapper et al., 2009). Physical activity is a growing health concern that can be targeted with interventions in which long-term maintenance is a crucial factor for attaining various health benefits (Painter et al., 2008; Reiner et al., 2013).

With the rise of adult physical inactivity and the increasing prevalence of associated negative health complications (Reiner et al., 2013; USDHHS, 2008), finding a way to improve physical activity adoption and adherence could greatly improve adult health. Self-compassion is associated with higher emotional regulation and improved behavioral regulation (Keng, Smoski, & Robins, 2011). Psychologically, self-compassion is associated with less rumination, less fear of failure, and less perfectionism (Neff, 2003a; Neff, Hsieh, & Dejitterat, 2005). There is potential for self-compassion to help individuals self-regulate physical activity behavior with less empha-

sis on being perfect. With previous self-compassion interventions improving other health regulatory behaviors, there is reason to believe self-compassion could improve physical activity behavior. Future researchers could implement and examine the effectiveness of the 8-week MSC intervention (Neff and Germer, 2013) on physical activity behavior. Understanding the influence of the MSC intervention on physical activity behavior could help lead to a greater understanding of long-term self-regulation of physical activity behavior.

There are limitations of the review that should be considered when interpreting the results. Only seven studies met the inclusion criteria of the review; therefore, a greater number of studies are needed to substantiate these findings. The quality of the included studies is another limitation. Although four studies were RCTs, the others included single group and qualitative designs. In addition, there was also great variability across studies regarding intervention duration, number of experimental groups, etc. The assessment of behavior change was another limitation of the interventions included because self-report measures were used across all seven studies and two did not rely on valid and reliable self-report instruments. Finally, because the review did not include unpublished studies or those published in languages other than English, relevant studies may have been excluded.

Conclusion

Self-compassion is at least as effective as other behavioral techniques at improving self-regulation of various health behaviors. Future researchers should continue to assess the effectiveness of self-compassion on health behavior across a wider range of ages, races, and gender. A RCT design is necessary to determine the difference in treatment between a self-compassion group, theory-based behavioral group, and control group on self-regulation of health behavior; however, because many of the included interventions were paired with other types of treatment,

future researchers should also use the validated self-compassion intervention (Neff & Germer, 2013) along with other theory-based techniques to effectively target specific theoretical constructs to improve regulation of health behaviors. Interventions should incorporate constructs from a single behavioral theory to determine the impact of each individual theory and underlying constructs on self-regulation of behavior, rather than combining constructs from multiple theories. Future researchers also need to examine each health behavior repeatedly within the above guidelines to establish the validity and reliability of a self-compassion intervention on regulation of each health behavior. Health behaviors should be directly monitored or at least measured with valid and reliable assessments to ensure the quality of the outcome measures. In summary, although the review was based on a small number of studies, it provides preliminary evidence of the effectiveness of self-compassion interventions for health behavior regulation.

References

- Adams, C. E., & Leary, M. R. (2007). Promoting self-compassionate attitudes toward eating among restrictive and guilty eaters. *Journal of Social and Clinical Psychology, 26*(10), 1120-1144.
- Alberts, H. J., Thewissen, R., & Raes, L. (2012). Dealing with problematic eating behaviour: The effects of a mindfulness-based intervention on eating behaviour, food cravings, dichotomous thinking and body image concern. *Appetite*.
- Allen, A. B., Goldwasser, E. R., & Leary, M. R. (2012). Self-compassion and well-being among older adults. *Self and Identity, 11*(4), 428-453.
- Barnard L. K., Curry J. F. (2011). Self-compassion: Conceptualizations, correlates, & interventions. *Review of General Psychology, 15*, 289–303.
- Baumeister, R. F., & Heatherton, T. F. (1996). *Self-regulation failure: An overview. Psychological Inquiry, 7*, 1–15.
- Baumeister, R. F., Heatherton, T. F., & Tice, D. M. (1994). Losing control: How and why people fail at self-regulation. San Diego, CA: Academic Press.
- Burnette, J. L., O'Boyle, E. H., VanEpps, E. M., Pollack, J. M., & Finkel, E. J. (2013). *Mind-sets matter: A meta-analytic review of implicit theories and self-regulation. Psychological Bulletin, 139*(3), 655.
- Carver, C. S., & Scheier, M. F. (1981). Attention and self-regulation: A control-theory approach to human behavior. New York, NY: Springer-Verlag.
- Carver, C. S., & Scheier, M. F. (2001). On the self-regulation of behavior. Cambridge University Press.

Centers for Disease Control and Prevention. State Indicator Report on Physical Activity, 2014.

Atlanta, GA: U.S. Department of Health and Human Services, 2014.

Conn, V. S., Hafdahl, A. R., & Mehr, D. R. (2011). Interventions to increase physical activity among healthy adults: meta-analysis of outcomes. *American Journal of Public Health, 101*(4), 751-758.

Conn, V. S., Hafdahl, A. R., Cooper, P. S., Brown, L. M., & Lusk, S. L. (2009). Meta-Analysis of Workplace Physical Activity Interventions. *American Journal of Preventive Medicine, 37*(4), 330–339.

Dishman, R. K., & Buckworth, J. A. N. E. T. (1996). Increasing physical activity: a quantitative synthesis. *Medicine and Science in Sports and Exercise, 28*(6), 706-719.

Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire? *International Journal of Eating Disorders, 16*, 363 –370.

Gale, C., Gilbert, P., Read, N., & Goss, K. (2014). An evaluation of the impact of introducing compassion focused therapy to a standard treatment programme for people with eating disorders. *Clinical Psychology & Psychotherapy, 21*(1), 1-12.

Gilbert, P. (2009). *The compassionate mind: A new approach to facing the challenges of life*. London: Constable Robinson.

Gilbert, P., & Irons, C. (2005). Focused therapies for shame and self-attacking, using cognitive, behavioural, emotional, imagery and compassionate mind training. In P. Gilbert (Ed.), *Compassion: Conceptualisations, Research and Use in Psychotherapy* (pp. 263-325). London: Brunner-Routledge.

- Gilbert, P., & Procter, S. (2006). Compassionate mind training for people with high shame and self-criticism: A pilot study of a group therapy approach. *Clinical Psychology and Psychotherapy*, 13, 353-379.
- Goss, K. (2011). *The Compassionate-Mind Guide to Ending Overeating: Using Compassion-Focused Therapy to Overcome Binging and Disordered Eating*. ReadHowYouWant.com
- Goss, K., & Allan, S. (2011). An introduction compassion focused therapy for eating disorders. *Eating and its Disorders*, 303-314.
- Goss, K., & Allan, S. (2014). The development and application of compassion-focused therapy for eating disorders (CFT-E). *British Journal of Clinical Psychology*, 53(1), 62-77.
- Gourlan, M., Bernard, P., Bortolon, C., Romain, A. J., Lareyre, O., Carayol, M., ... & Boiché, J. (2015). Efficacy of theory-based interventions to promote physical activity. A meta-analysis of randomised controlled trials.
- Greeson, J. M., Toohey, M. J., & Pearce, M. J. (2015). An adapted, 4-week mind-body Skills group for medical Students: Reducing stress, increasing mindfulness, and enhancing self-care. *EXPLORE: The Journal of Science and Healing*.
- Group, P. C. R. (2008). Patients' preferences within randomised trials: systematic review and patient level meta-analysis. *BMJ: British Medical Journal*, 337.
- Hayes, S.C. & Smith, S. (2005). *Get Out of Your Mind and Into Your Life*. Oakland CA: New Harbinger Publications.
- Kabat-Zinn, J. (1994). *Wherever you go there you are*. New York: Hyperion.
- Kelly, A. C., & Carter, J. C. (2014). Self-compassion training for binge eating disorder: A pilot randomized controlled trial. *Psychology and Psychotherapy: Theory, Research and Practice*.

- Kelly, A. C., Carter, J. C., & Borairi, S. (2014). Are improvements in shame and self-compassion early in eating disorders treatment associated with better patient outcomes?. *International Journal of Eating Disorders*, 47(1), 54-64.
- Kelly, A. C., Zuroff, D. C., Foa, C. L., & Gilbert, P. (2009). Who benefits from training in self-compassionate self-regulation? A study of smoking reduction. *Journal of Social and Clinical Psychology*, 29(7), 727-755.
- Keng, S. L., Smoski, M. J., & Robins, C. J. (2011). Effects of mindfulness on psychological health: A review of empirical studies. *Clinical Psychology Review*, 31, 1041–1056.
- Leary, M. R., Tate, E. B., Adams, C. E., Batts Allen, A., & Hancock, J. (2007). Self-compassion and reactions to unpleasant self-relevant events: The implications of treating oneself kindly. *Journal of Personality and Social Psychology*, 92, 887–904.
- Lee I, Shiroma E, Lobelo F, Puska P, Blair S, Katzmarzyk P. Articles: Effect of physical inactivity on major non-communicable diseases worldwide: an analysis of burden of disease and life expectancy. *The Lancet* [serial online]. July 21, 2012; 380:219-229.
- Linke, S. E., Gallo, L., C., & Norman, G. J. (2011). Attrition and adherence rates of sustained vs. intermittent exercise interventions. *Annals of Behavioral Medicine*, 42(2), 197-209.
- Lockard, A. J., Hayes, J. A., Neff, K., & Locke, B. D. (2014). Self-Compassion Among College Counseling Center Clients: An Examination of Clinical Norms and Group Differences. *Journal of College Counseling*, 17(3), 249-259.
- Maher, C. A., Lewis, L. K., Ferrar, K., Marshall, S., De Bourdeaudhuij, I., & Vandelanotte, C. (2014). Are health behavior change interventions that use online social networks effective? A systematic review. *Journal of Medical Internet Research*, 16(2), e40.
- Marcus, B. H., & Forsyth, L. (2003). *Motivating people to be physically active*. Human Kinetics.

- McHugh, R. K., Whitton, S. W., Peckham, A. D., Welge, J. A., & Otto, M. W. (2013). Patient preference for psychological vs pharmacologic treatment of psychiatric disorders: a meta-analytic review. *The Journal of Clinical Psychiatry*, 74(6), 1-478.
- Mirowsky, J., & Ross, C. E. (1992). Age and depression. *Journal of Health and Social Behavior*, 187-205.
- Neely, M. E., Schallert, D. L., Mohammed, S. S., Roberts, R. M., & Chen, Y. J. (2009). Self-kindness when facing stress: The role of selfcompassion, goal regulation, and support in college students' well-being. *Motivation and Emotion*, 33, 88-97.
- Neff K. D. (2011). Self-compassion, self-esteem, and well-being. *Social and Personality Psychology Compass*, 5, 1-12.
- Neff, K. (2003a). The development and validation of a scale to measure self-compassion. *Self and Identity*, 2, 223-250.
- Neff, K. (2003b). Self-Compassion: An Alternative Conceptualization of a Healthy Attitude Toward Oneself. *Self and Identity*, 2, 85-101.
- Neff, K. D., & Germer, C. K. (2013). A pilot study and randomized controlled trial of the mindful self-compassion program. *Journal of Clinical Psychology*, 69(1), 28-44.
- Neff, K., Hsieh, Y., & Dejitterat, K. (2005). Self-compassion, achievement goals, and coping with academic failure. *Self and Identity*, 4, 263-287.
- Neff, K., Kirkpatrick, K., & Rude, S. (2007). Self-compassion and adaptive psychological functioning. *Journal of Research in Personality*, 41, 139-154.
- Neff, K., & Vonk, R. (2009). Self-compassion versus global self-esteem: Two different ways of relating to oneself. *Journal of Personality*, 77, 23-50.

- Painter, J. E., Borba, C. P. C., Hynes, M., Mays, D., & Glanz, K. (2008). The use of theory in health behaviour research from 2000 to 2005: a systematic review. *Annals of Behavioral Medicine*, 35, 358-362.
- Prince, S. A., Adamo, K. B., Hamel, M. E., Hardt, J., Gorber, S. C., & Tremblay, M. (2008). A comparison of direct versus self-report measures for assessing physical activity in adults: a systematic review. *International Journal of Behavioral Nutrition and Physical Activity*, 5(1), 56.
- Reiner, M., Niermann, C., Jekauc, D., & Woll, A. (2013). Long-term health benefits of physical activity—a systematic review of longitudinal studies. *BMC Public Health*, 13(1), 813.
- Saunders, P. A., Tractenberg, R. E., Chaterji, R., Amri, H., Harazduk, N., Gordon, J. S., ... & Haramati, A. (2007). Promoting self-awareness and reflection through an experiential mind-body skills course for first year medical students. *Medical Teacher*, 29(8), 778-784.
- Rothwell, P. M. (2005). External validity of randomised controlled trials: “to whom do the results of this trial apply?” *The Lancet*, 365(9453), 82-93.
- Schoenborn, C. A., Adams, P. F., & Peregoy, J. A. (2013). Health behaviors of adults: United States, 2008-2010. *Vital and health statistics. Series 10, Data from the National Health Survey*, (257), 1-184.
- Skelton, J. A., & Beech, B. M. (2011). Attrition in paediatric weight management: a review of the literature and new directions. *Obesity Reviews*, 12(5), e273-e281.
- Sirois, F. M. (2015). A self-regulation resource model of self-compassion and health behavior intentions in emerging adults. *Preventive Medicine Reports*, 2, 218-222.

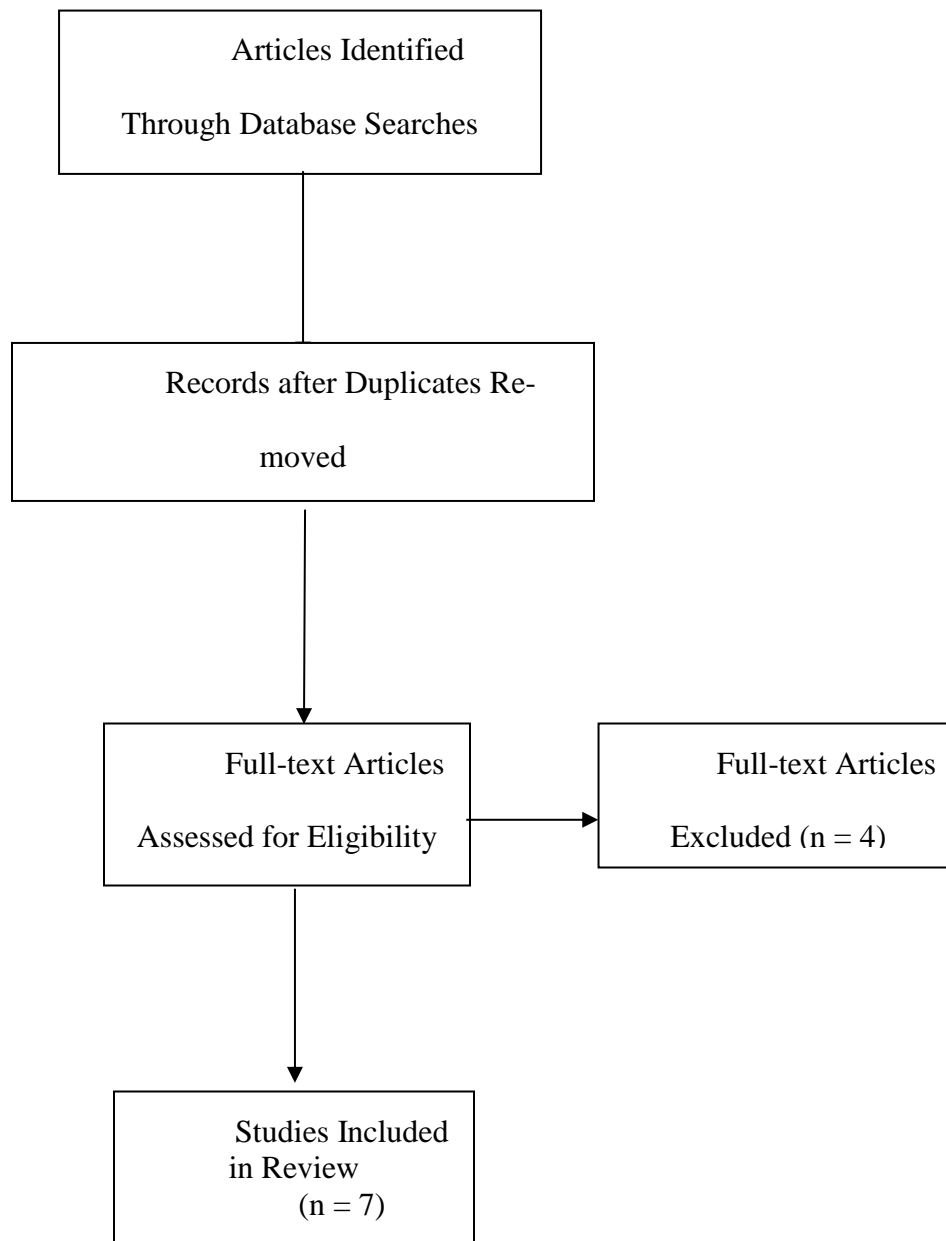
- Tapper, K., Shaw, C., Ilsley, J., Hill, A. J., Bond, F. W., & Moore, L. (2009). Exploratory randomised controlled trial of a mindfulness-based weight loss intervention for women. *Appetite*, 52(2), 396-404.
- Taylor, N., Conner, M., & Lawton, R. (2012). The impact of theory on the effectiveness of worksite physical activity interventions: a meta-analysis and meta-regression. *Health Psychology Review*, 6(1), 33-73.
- Terry, M. L., Leary, M. R., Mehta, S., & Henderson, K. (2013). Self-compassionate reactions to health threats. *Personality and Social Psychology Bulletin*, 39(7), 911-926.
- U.S. Department of Health & Human Services. Physical Activity Guidelines Advisory Committee report.2008 [cited 1 September 2011]; Available from:
<http://www.health.gov/paguidelines/>
- Webb, T., Joseph, J., Yardley, L., & Michie, S. (2010). Using the internet to promote health behavior change: a systematic review and meta-analysis of the impact of theoretical basis, use of behavior change techniques, and mode of delivery on efficacy. *Journal of Medical Internet Research*, 12(1), e4.
- World Health Organization (Ed.). Global health risks: mortality and burden of disease attributable to selected major risks. World Health Organization, (2009).
- World Health Organization. Global recommendations on physical activity for health. Geneva, Switzerland: WHO; 2010.
- Yarnell, L. M., Stafford, R. E., Neff, K. D., Reilly, E. D., Knox, M. C., & Mullarkey, M. (2015). Meta-analysis of gender differences in self-compassion. *Self and Identity*, 14(5), 499-520.

Table 1. Characteristics of Included Studies

Study	Sample Characteristics	Intervention	Measure(s) of Health Behavior	Self-Compassion Duration And Attrition	Theoretical Framework; Behavior Modification Strategies	Intervention Outcomes
Adams, C. E., & Leary, M. R. (2007).	N = 84; female undergraduate students, RCT with 3 groups: 1) pre-load/self-compassion, 2) Preload/no self-compassion, 3) no-preload Control)	Preload/SC and pre-load/no-SC conditions ate preload of food, and participants in the no-preload control group received no food to eat. Preload/SC received SC intervention. All participants performed a bogus taste test (to measure eating behavior) and completed self-report measures.	Behavior: Overeating Measure: Revised Rigid Restraint Scale	Duration: 2-minutes Attrition: NA	Self-regulation theory Emotional regulation strategies; self-compassionate imagery, thinking, emotions, and behavior	Self-compassion pre-load food condition at least as effective at reducing eating behavior over time as the non-self-compassion pre-load food condition.
Gale, C., Gilbert, P., Read, N., & Goss, K. (2014).	N = 99; 95% female, <i>M</i> age = 28.01, Single-group RM design	Introduced 4-week self-compassion intervention during week 8 of traditional 16-week eating disorder treatment program to improve eating disorder symptomatology	Behavior: Eating disorder symptomology Measure: Eating Disorder Examination Questionnaire	Duration: 4-weeks of self-compassion 12-weeks total treatment Attrition: 22%	Compassion Focused Therapy Emotional regulation strategies; self-compassionate imagery, thinking, emotions, and behavior	Self-compassion training in addition to traditional CBT improved eating disorder symptomatology over the 16-week intervention.
Greeson, J. M., Toohey, M. J., & Pearce, M. J. (2015).	N = 44 medical students, 66% female, 34% male, qualitative interviewing	Participants received 4 1.5-hour self-care workshops and homework over the course of 11-week course in addition to monitoring a chosen self-care goal.	Behavior: Self-care (sleep, exercise, eating) Measure: Qualitative interview	Duration: 11-weeks Attrition: 16%	No theory Self-care and skill-building workshop, stress reduction, meditation, reflection	Thematic analysis of qualitative interviews revealed increased perceived self-care behaviors including sleep, eating, and exercise.
Kelly, A. C., & Carter, J. C. (2014).	N = 41 BED patients, 83% female, 17% male, 75% White, <i>M</i> age = 45 years, 3-group RCT	All conditions received CBT for eating disorder symptomatology. The behavioral condition received ways to replace binge-eating impulses with other behaviors. The self-compassion condition viewed a	Behavior: Eating disorder symptomology Measure: Eating Disorder	Duration: 3-week self-compassion 12-week total treatment	Compassion Focused Therapy PowerPoint, letter writing, imagery, and self-talk	Self-compassion intervention was equally effective as a behavioral-replacement intervention in reducing weekly binge eating episodes and weekly binge days over a 12-week period.

	design: 1) waitlist control, 2) behavioral strategies, 3) self-compassion strategies	powerpoint, wrote a self-compassionate letter to themselves, and learned compassionate imagery and self-talk.	der Examination Questionnaire	Attrition: 14.6%		
Kelly, A. C., Carter, J. C., & Borairi, S. (2014).	N = 97 ED inpatients, <i>M</i> age = 28 years, 97% female, 3% male, 79% White, 11% Latino, 5% East Asian, 5% other Single-group RM design	All participants received group-based cognitive behavioral therapy in addition to self-compassion training throughout 12-weeks of treatment.	Behavior: Eating disorder symptomology Measure: Eating Disorder Examination Questionnaire	Duration: 12-week combination of CBT and self-compassion Attrition: 35%	Compassion Focused Therapy Emotional regulation strategies; self-compassionate imagery, thinking, emotions, and behavior	Self-compassion training in conjunction with CBT resulted in significant improvements in eating disorder symptomology following the 12-week intervention.
Kelly, A. C., Zuroff, D. C., Foa, C. L., & Gilbert, P. (2010).	126 adults, <i>M</i> age = 24 years, 54% females, 46% males, 64% White, 4% Hispanic, 8% Middle-Eastern 16% Asian, 8% Mixed, 4-group RCT	All four conditions received 20-minute PowerPoint rationale about self-monitoring (control). Self-compassion group received a guided self-compassion PowerPoint to help create ideal self and self-talk. The self-energizing and self-controlling interventions received tailored PowerPoints to improve those constructs.	Behavior: Cigarette smoking behavior Measure: Self-reported cigarettes smoked/week	Duration: 3-weeks Attrition: 19%	Self-regulation theory PowerPoint, imagery and creation of the ideal self-compassionate self	Over a three week period, the self-compassion intervention reduced cigarettes per day to the same degree as two other imagery-based self-talk interventions
Tapper, K., Shaw, C., Ilsley, J., Hill, A. J., Bond, F. W., & Moore, L. (2009).	N = 62 individuals, <i>M</i> age = 44 years (intervention), 31 years (control), <i>M</i> BMI = 31, 2-group RCT	Intervention participants received ACT via pen-and paper, homework, and metaphors over 3-weeks to enhance, help break links between food- and exercise-related thoughts and behavior, and improve acceptance, in addition to a CD with imagery and meditation.	Behavior: Physical Activity Measure: Brief Physical Assessment Tool	Duration: 3-week ACT Attrition: 16%	No theory Personal health values, motivation, cognitive diffusion, reducing link between food- and exercise-related thoughts and behavior, meditation, and imagery	ACT intervention condition reported statistically significantly greater increase in self-reported physical activity in comparison to the control condition over the intervention.

Figure 1.1



Identification of Included Studies.

2 THE EFFECT OF A MINDFUL SELF-COMPASSION INTERVENTION ON UNIVERSITY EMPLOYEE PHYSICAL ACTIVITY MOTIVATION AND BE- HAVIOR

Physical inactivity is a contributing factor to various chronic diseases and health problems in the United States such as cardiovascular disease, type 2 diabetes, stroke, various cancers, and depression and anxiety (Alwan, 2011; Reiner, Niermann, Jekauc, & Woll, 2013). Reducing the risk of chronic disease is possible by engaging in regular physical activity (PA), which is defined as meeting the current guidelines of at least 150 weekly minutes of moderate or 75 minutes of vigorous aerobic activity (or a combination of the two) and two days of muscle strengthening activities (U.S. Department of Health and Human Services, 2008). Unfortunately, nearly 79% of American adults are not meeting the recommended levels of PA (CDC, 2014) and this may be partially attributed to an increase in sedentary jobs (American Heart Association, 2013). With an estimated 140 million employed adults (Bureau of Labor Statistics U.S. Department of Labor; 2011) spending more than half of their waking hours in the workplace (Gilson, McKenna, Cooke, & Brown, 2007), it is an important setting in which to implement PA interventions.

One reason why adults may struggle to adhere to PA is because of a failure to self-regulate their healthy behaviors. Self-regulation is an individual's ability to engage in and adhere to a behavior (Carver & Sheier, 2001). Self-regulation is comprised of a four-step process that includes: (a) setting goals (i.e., creating a specific vision or standard by which an individual wants to measure their success); (b) engaging in goal-directed behavior (i.e., PA); (c) monitoring goals and resultant behavior (i.e., failing to monitor progress towards goals can lead to overestimation of PA participation); and (d) adjusting goals when necessary (i.e., as an individual becomes more intentional with their goals and understands their progress towards regular PA, they will become

more aware of and equipped to overcome barriers; Baumeister & Heatherton, 1996; Carver & Scheier, 1981). It is important to note that self-regulation is an internal resource that can be depleted, but if self-regulation could be enhanced through an intervention or become less necessary for health behaviors, intended and actual behavior may increase.

Learning to self-regulate PA may be improved through theory-based interventions (Marcus & Forsyth, 2003). Using theories to design interventions provides testable hypotheses about the mediating pathways through which they may cause behavior change. The theory of planned behavior (TPB; Ajzen, 1991; see Figure 2.1) hypothesizes that intention, an individual's level of motivation, is the primary determinant of behavior. Intention, in turn, is determined by attitude, subjective norm, and perceived behavioral control (PBC; Ajzen, 1991). Attitude is a positive or negative perception of the behavior, subjective norm is the perceived social pressure to perform a behavior, and PBC is the perceived ease or difficulty of performing a behavior (Ajzen, 1991).

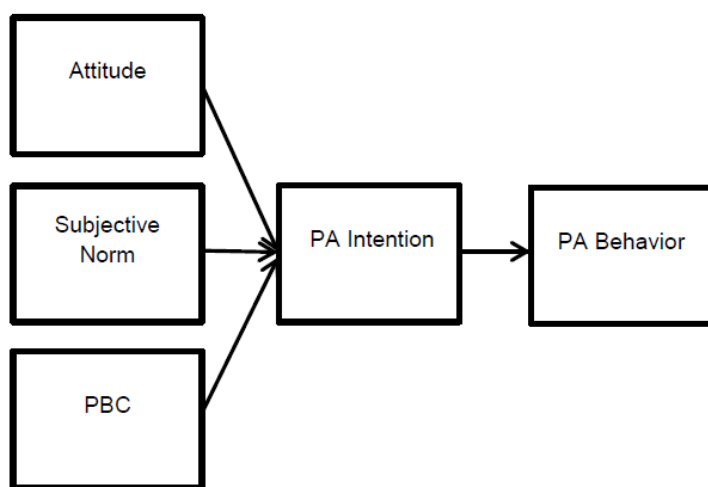


Figure 2.1 Theory of Planned Behavior

Symons Downs and Hausenblas (2005) conducted a meta-analytic review of 111 TPB and PA studies and reported large effect sizes (ES) for the attitude-intention ($ES = 1.07$), PBC-

intention ($ES = 0.90$), and intention-PA ($ES = 1.01$) pathways. Moderate effect sizes were reported for the subjective norm-intention ($ES = 0.59$) and PBC-PA ($ES = 0.51$) pathways. In addition, the strongest predictors of intention were attitude ($\beta = 0.34$) and PBC ($\beta = 0.27$), and the strongest predictor of PA was intention ($\beta = 0.42$). Therefore, the TPB is a valid theoretical framework for intervention design.

Intervention strategies that may be effective for targeting change in attitude, subjective norm, and PBC; thereby increasing PA motivation and behavior, are those that focus on self-compassion (see Figure 2.2; Neff, 2003). Self-compassion is the ability to treat oneself in the same manner as a best friend going through the same situation (Neff, 2003a). Self-compassion is made up of three psychological pairings: (a) self-kindness vs. self-judgment, (b) common humanity vs. isolation, and (c) mindfulness vs. over-identification (Neff, 2003a). Self-compassionate individuals respond more favorably to criticism, recover more effectively following failure and setbacks, and set more intrinsic goals when compared to less self-compassionate individuals (Magnus, Kowalski, & McHugh, 2010; Neff, 2003a; Neff, Hsieh, & Dejitterat, 2005). Self-compassion is also positively related to feelings of connectedness, agreeableness, and the desire to please others (Neff, 2003a; Neff et al., 2007a); as well as with positive affect, self-efficacy or PBC, and health behavior intention (Sirois et al., 2015). Moreover, self-compassion was found to explain 23% of the variance in intention to engage in health behaviors (Sirois et al., 2015). While further research is required, these findings suggest that self-compassion may be able to impact subjective norm, and could also bolster affective self-regulatory processes such as attitude and PBC, potentially improving intention to engage in behavior (Sirois et al., 2015). A recent systematic review provided preliminary evidence about the effectiveness of self-compassion for health behavior regulation (Biber & Ellis, 2017; see Chapter 1). However, further research is necessary

to examine the impact of self-compassion training on the self-regulation of PA. Therefore, the main purpose of the proposed study was to develop, implement, and evaluate a TPB intervention that incorporated self-compassion training to improve attitude, subjective norm, and PBC towards PA; thereby increasing PA intention and behavior. Furthermore, this intervention was implemented in coordination with an existing workplace PA program at a major urban institution.

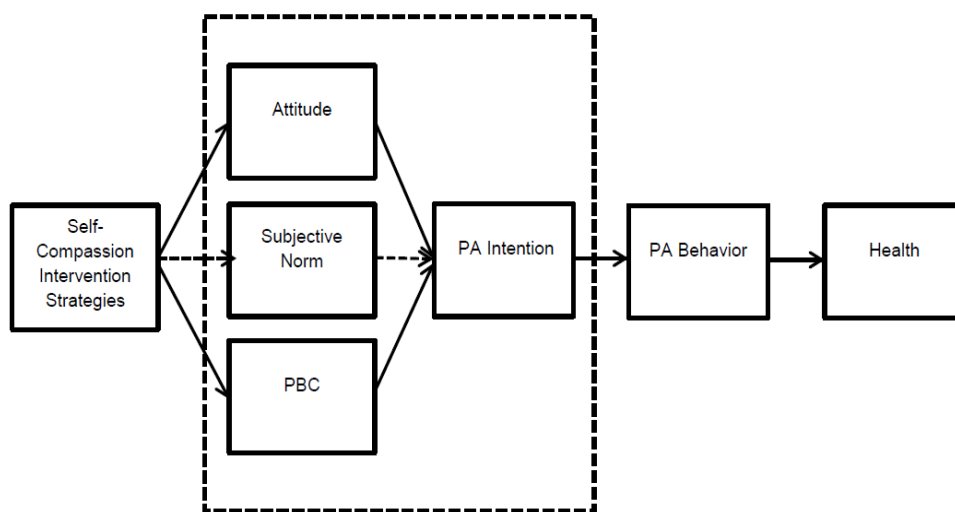


Figure 2.2 Proposed Conceptual Framework

Desire2Move (D2M) was an annual 8-week team-based PA program designed for Georgia State University (GSU) employees that had successfully been implemented during the past three years. A program evaluation of the first implementation of D2M revealed positive results for effectiveness (Biber & Ellis, 2016). Specifically, 58 employees recorded a weekly average of 192 minutes of PA during the 8-week program. After the program, D2M participants scored significantly higher than non-D2M participants on attitude and intention, and although not significantly different, D2M participants reported greater PA participation than the non-D2M participants. Based on these findings and the identified relationships between self-compassion and self-

regulation of health behavior, the specific objective of the proposed study was to test the effects of the intervention on self-compassion, the TPB constructs, and PA behavior among university employees. It was hypothesized that participants completing the self-compassion training (treatment group) would report significantly greater changes in self-compassion, the TPB constructs (i.e., attitude, subjective norm, PBC, and intention), and PA behavior from pre- to post-intervention and record significantly greater minutes of PA during the 8-week D2M program compared with participants who only participated in the D2M program without self-compassion training (i.e., attention control group).

Methodology

Participants

Eligible participants were employees from 11 GSU departments that were invited and agreed to participate in the fourth annual D2M competition (Spring 2017): College of Education and Human Development Office of the Dean (CEHD), Counseling and Psychological Services (CPS), Gerontology Institute (GERO), Honors College (HC), Human Resources (HR), Kinesiology and Health (KH), Physical Therapy (PT), Police Department (PD), Recreational Services (RS), Undergraduate University Advisement Center (UAC), and University Housing (UH). Based on previous D2M participation rates (~50%), we expected 400 employees would enroll in D2M, and we further estimated 50% of those employees would consent to or be eligible to participate in the proposed research ($n = 200$). Furthermore, with attrition rates of exercise interventions between 7% and 58% (Linke, Gallo, & Norman, 2011), we conservatively expected a 50% attrition rate over the 8-week intervention resulting in a final sample of 100 participants (~50 participants per group). However, based on 80% power to detect a medium-sized interaction, a

minimum sample size of 96 participants (~48 per group) was needed (G*Power 3.1.9.2; effect size $f = .25$; $\alpha = .05$; power = .80).

Measures

Demographic questionnaire. This measure solicited self-reported age, gender, race and/or ethnicity, education, income, employment status, and department affiliation, as well as self-reported height and weight (see Appendix A).

Self-compassion scale-short form (SCS-SF). The SCS-SF (Raes, Pommier, Neff, & Van Gucht, 2010) was a 12-item short form of the self-compassion scale that measured one's level of self-compassion (see Appendix B). Self-compassion was measured by items on a 5-point scale ranging from 1 (almost never) to 5 (almost always). Confirmatory factor analysis indicated a single higher order factor explained the intercorrelation between the six subscales of the self-compassion long-form (nonnormed fit index = .96, comparative fit index = .97; Raes et al., 2011). A total self-compassion score was calculated by reverse scoring the negative subscale items and computing a total mean. The SCS-SF demonstrated high internal consistency ($\alpha = .86$) and strong retest reliability over 5 months (.71). The SCS-SF is highly correlated with the long form ($r = .98$, Raes et al., 2011).

TPB questionnaire. An 18-item questionnaire using 7-point Likert-type scales developed according to the recommendations by Ajzen (2002; see Appendix C) was used to measure the TPB constructs. Participants were asked to respond to each question by referencing the definition of “regular physical activity” that was based on the current PA guidelines (USDHHS, 2008). To measure attitude, seven adjective pairs (e.g., 1 = boring and 7 = interesting, 1 = harmful and 7 = beneficial, 1 = unpleasant and 7 = pleasant) rated the following statement: “For me,

participating in regular physical activity is”. Subjective norm was measured using four statements such as, “Most people who are important to me participate in regular physical activity” (strongly disagree = 1 and strongly agree = 7) and, “Most people who are important to me want me to participate in regular physical activity” (1 = strongly disagree and 7 = strongly agree). Perceived behavioral control (PBC) was assessed with four questions, such as, “If you are really motivated, how confident are you that you can participate in regular physical activity?” (1 = not confident at all and 7 = completely confident) and “If you are really motivated, participating in regular physical activity is” (1 = easy and 7 = difficult). Intention was measured by three statements including “I intend to participate in regular physical activity (1 = strongly disagree and 7 strongly agree). When applicable, answers were reverse-coded so higher scores for each construct represented more positive attitude, stronger subjective norm, stronger PBC, and greater intention. Scores were averaged for each construct to obtain a final score.

Godin leisure-time exercise questionnaire (GLTEQ, Godin & Shephard, 1985). The GLTEQ asked participants to consider their PA habits during a typical week (see Appendix D). Participants reported the number of times they engaged in at least a 15-minute bout of strenuous, moderate, and mild exercise. Total weekly leisure time activity was determined by multiplying the number of bouts of strenuous activity x 9 (i.e., estimated MET value), number of bouts of moderate activity x 5, and number of bouts of mild activity x 3 and summing for a total score. The GLTEQ had good test-retest reliability over the course of one month ($r = .64$) and good validity as demonstrated by associations with maximum oxygen intake (VO_2 max), body fat, and muscular endurance (Gionet & Godin, 1989; Godin & Shephard, 1985). However, for the purpose of this study, the GLTEQ was modified for consistency with the current PA guidelines

(USDHHS, 2008) that emphasized moderate and vigorous intensity exercise and the accumulation of 10 minute bouts of activity. The duration of the bouts on the GLTEQ were changed from 15-minutes to 10-minutes and the total score only included the sum of the strenuous and moderate intensity activities. Previous researchers have used similar scoring procedures (Ellis, Kosma, & Symons Downs, 2013; Symons Downs, Graham, Yang, Bargainnier, & Vasil 2006).

MapMyRun. During D2M, participants logged their daily minutes and modes of PA on either the *MapMyRun* website (www.mapmyrun.com) or smartphone application. *MapMyRun* is a PA self-monitoring application that uses built-in GPS to track duration, distance, pace, and speed of PA bouts. *MapMyRun* also allows manual logging of PA mode, intensity, and duration. A preliminary validation study indicated a strong correlation between minutes of PA on the *MapMyRun* PA self-monitoring application and the FitBit Zip accelerometer ($r = .79$; Biber & Ellis, *in progress*).

Intervention adherence. The frequency of podcast use was tracked on a private YouTube account. While each intervention was sent to participants as a link via email, the video was embedded on YouTube and frequency of use was tracked. The length of use and frequency of use per participant for each podcast was confidentially tracked. When a participant accessed a podcast each day, the data was monitored so the research team could understand whether participants were adhering to the intervention over the course of the seven weeks.

Procedures

Employees from 11 departments were invited to participate in the fourth annual D2M program (Spring 2017). Employees who volunteered for D2M were sent an email invitation to participate in this research study (Appendix E) that included a link to an IRB approved electronic consent form (see Appendix F) and the pre-intervention questionnaires (i.e., demographics, SCS-

SF, TPB, & GLTEQ). After anticipated declinations and exclusions, group assignment was performed at the department level to control for contamination such that half of the participating departments were assigned to the treatment group and half to the attention control group. Although analyses of previous D2M data did not reveal statistical differences among departments on the primary outcome variables, with the addition of new departments to the 2017 D2M program, attempts were made to match departments across the treatment and attention control groups based on comparable demographic qualities including department size and past D2M participation. The goal was to achieve a balanced sample size between the two groups ($n = 48 \times \text{group}$).

During the D2M program, participants in both the self-compassion treatment group and the attention control group logged their PA minutes and modes using the *MapMyRun* website or smartphone application and received weekly tips and reminders. They logged their PA for eight consecutive weeks. A bout had to be a minimum of 10 consecutive minutes of moderate-to-vigorous PA (MVPA) for it to be recorded. They received a weekly motivational quote from their team captain along with reminders to log PA.

In addition to the D2M procedures, treatment group participants were asked to complete a seven-week self-compassion intervention beginning the second week of the D2M program (see Appendix G). The intervention aimed to increase attitude, subjective norm, and PBC, and thereby, increasing PA motivation and behavior by using self-compassion meditation strategies. Employees in the treatment group were emailed an electronic link every day of the intervention to access the intervention information (mp3 audio file podcast). Validated self-compassion activities and behavioral strategies were integrated to address common exercise motivators and barriers (Neff, 2003a). A detailed description of each meditation podcast can be found in Appendix G and the following website (www.selfcompassion.org). Participants were instructed to listen to the

podcast at least once per week for the following week, with the goal of listening to it as often as once per day. At the end of the D2M challenge, participants had received seven different SC podcasts.

Liaisons (student research assistants) assigned to each team monitored and collected the PA minutes for all D2M participants and were blinded to group assignment. Each week, the team liaisons entered the individual team member's total PA minutes and calculated the individual's average total PA minutes throughout the D2M competition. At the end of the 8-week D2M challenge, the team with the greatest overall average of PA minutes was the winner. Individual winners were identified for each team as well. Approximately one week after D2M, all study participants were sent a link to an online survey that included the outcome measures (SCS-SF, TPB, GLTEQ). If results for the treatment group indicate effectiveness of the intervention, it will be made available to all D2M participants, including those from the attention control group, during the next D2M program (Spring 2018).

Data Analysis

Tests of normality were performed and possible outliers were removed from the sample. However, before removal, attempts were made to clarify whether potential outliers were the result of a data entry mistake. Intention-to-treat (ITT) procedures, in which the last observation is carried forward, were used to account for follow-up data missing due to participant attrition. For missing data attributed to non-response, data were replaced using the imputation approach in which missing values were filled in with estimations for the missing data. To help account for skipping questions and data shirkers, one manipulation question was added to each questionnaire to ensure participants read questions before responding.

All variables were summarized with frequencies, means, and standard deviations. Separate ANOVAs with Bonferonni correction were used to determine group differences for continuous variables (age, BMI, SCS-SF, TPB, and GLTEQ) and Chi-square was used to determine group differences for the categorical variables (gender, race, education, employee status, and income) between the treatment and attention control groups at baseline. Scale reliabilities (i.e., Cronbach's alpha; α) were calculated for the SCS-SF and TPB questionnaires. Alphas greater than or equal to .70 were classified as acceptable, .60-.69 were considered questionable, .50-.59 were classified as poor, and below .50 were considered unacceptable (George & Mallery, 2016). Pearson correlations were performed to examine the associations among self-compassion, the TPB constructs, and self-reported PA (GLTEQ). Correlations between .10-.29 were considered small, between .30-.49 were considered moderate, and .50 and greater were considered large (Cohen, 1988).

Intervention adherence was summarized with total and mean listen time, listen frequency, and percentage listened for each podcast. To analyze changes in self-compassion, the TPB constructs, and self-reported PA (GLTEQ) from pre- to post-intervention between the groups, separate repeated measures mixed ANOVAs with Bonferroni correction with group assignment (treatment and attention control) as the between-groups variable and time (pre-intervention and post-intervention) as the within-groups variable were used. Separate one-way ANOVAs with Bonferroni correction were also used to determine group differences for weekly and total PA minutes (*MapMyRun*) between the treatment and attention control groups during D2M. Hedges' *g* was calculated to determine meaningfulness of between-subject differences at post-intervention

and is recommended for small sample sizes (Lakens, 2013). Effect sizes around .20 were considered small, around .50 were considered moderate, and .80 and greater were considered large (Hedges & Olkin, 1985).

Results

Twenty-six employees expressed interest in participating in the study and were emailed the link to the electronic consent form and pre-intervention survey. Four individuals who expressed interest did not consent to participate and two individuals consented to participate, but did not complete the survey. The final sample included 20 employees who were participating in D2M (see Figure 2.3). Participants were between the ages of 28 and 70 years ($M = 42.65$ years, $SD = 13.18$) with an average BMI of 23.97 ($SD = 3.14$; see Table 2.1). The sample was 80.0% female and 80.0% Caucasian. All the participants had at least a bachelor's degree, 35% earned \$50,000-\$99,999 annually, and were graduate students (35%), staff (30%), or faculty (35%) at GSU. Participants represented six university departments that competed in D2M ($n = 3$ CEHD, $n = 4$ CPS, $n = 1$ GERO, $n = 2$ HC, $n = 8$ KH, $n = 2$ UH). Eleven participants were placed in the treatment group (GERO, KH, UH) and nine participants were placed in the attention control group (CEHD, CPS, HC).

There were no missing values and no univariate or multivariate outliers were identified. The data were normally distributed based on skewness and kurtosis values (i.e., skew < 3.00 and kurtosis < 10.00 ; Kline, 2010). There were no significant differences between the groups for any of the demographic variables, self-compassion, TPB variables, or PA at baseline. Two participants did not complete the post-intervention survey and ITT procedures (i.e., last observation carried forward) were used to replace the missing data.

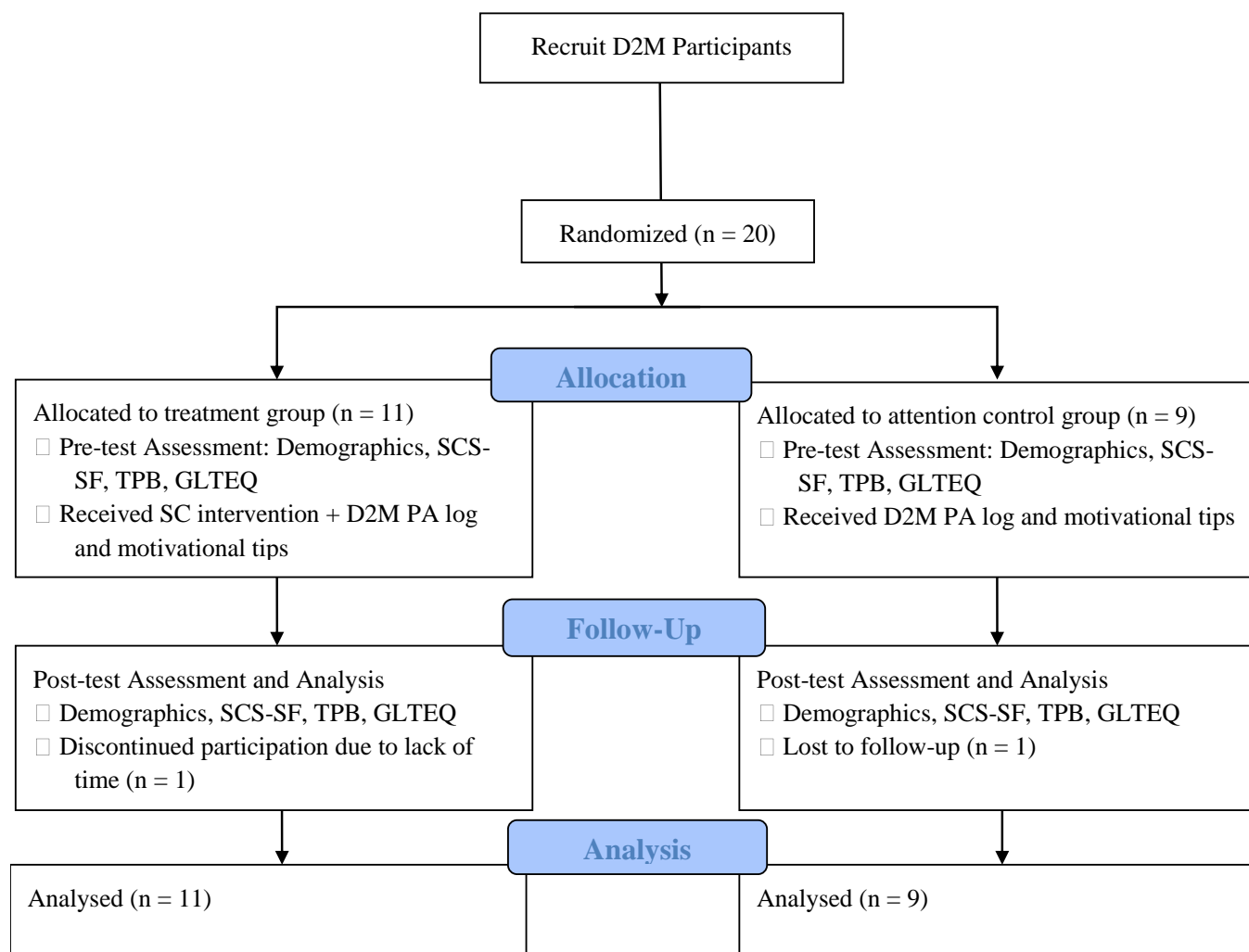


Figure 2.3. Diagram of flow of participants through data collection

Table 2.1

Participant Characteristics

Characteristic		Treatment (<i>n</i> = 11)		Attention Control (<i>n</i> = 9)		Total (<i>N</i> = 20)	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Age (years)		39.82	11.92	46.11	14.50	42.65	13.18
Body Mass Index		23.75	2.82	24.24	3.65	23.97	3.14
		<i>n</i>	%	<i>n</i>	%	<i>N</i>	%
Gender	Male	3	27.30	1	11.11	4	20.00
	Female	8	72.70	8	88.89	16	80.00
Race	White	8	72.70	8	88.89	16	80.00
	Other	3	27.30	1	11.11	4	20.00
Education	Bachelor's	2	18.18	0	00.00	2	10.00
	Graduate/Profess.	9	81.82	9	100.00	18	90.00
Employee Status	Graduate Assistant	4	36.36	3	33.33	7	35.00
	Staff	3	27.27	3	33.33	6	30.00
	Faculty	4	36.36	3	33.33	7	35.00
Annual Income	Less than \$25,000	3	27.27	1	11.11	4	20.00
	\$25,000-\$49,000	3	27.27	3	33.33	6	30.00
	\$50,000-\$99,000	4	36.36	3	33.33	7	35.00
	\$100,000-\$149,000	1	9.10	2	22.22	3	15.00

The SCS-SF and TPB scales had acceptable internal consistency with Cronbach's alpha between .75 and .98 at pre- and post-intervention (see Table 2.2). Pearson correlations among the

outcome variables are also presented in Table 2.2. Self-compassion was not significantly associated with any of the TPB constructs (pre- and post-intervention) except post-intervention attitude or self-reported PA (GLTEQ) pre- or post-intervention. Baseline self-reported PA (GLTEQ) had large associations with baseline attitude, PBC, and intention. Post-intervention self-reported PA was not significantly correlated with any of the TPB variables post-intervention. Post-self-reported PA had large associations with baseline attitude, PBC, intention, and self-reported PA. Finally, total PA during D2M (*MapMyRun*) had large associations with baseline attitude, PBC, intention, and self-reported PA, as well as post-intervention self-compassion and self-reported PA.

Table 2.2

Scale Reliabilities and Correlations among Self-Compassion, TPB Constructs, and Physical Activity

Variables	1	2	3	4	5	6	7	<i>Pre-α</i>	<i>Post-α</i>
1. SCS-12	-	-.20	-.32	.18	-.07	.05	.09	.92	.79
2. ATT	.45*	-	.14	.76**	.59**	.56**	.58**	.88	.81
3. SN	.15	.39	-	-.26	-.14	-.26	.08	.81	.75
4. PBC	.37	.88**	.35	-	.69**	.72**	.45*	.84	.88
5. INT	.36	.86**	.32	.90**	-	.79**	.51*	.77	.98
6. GLTEQ	-.02	.42	.25	.35	.32	-	.53*	-	
7. MMR	.51*	.36	.04	.25	.18	.45*	-	-	

* correlation is significant at 0.05 level (2-tailed).

** correlation is significant at 0.01 level (2-tailed).

Note: SCS-12 = self-compassion short-form-12; ATT = attitude; SN = subjective norm; PBC = perceived behavioral control; INT = intention; GLTEQ = Godin Leisure-Time Exercise Questionnaire; MMR = *MapMyRun*. Intercorrelations for pre-intervention measures are presented above the diagonal. Intercorrelations for post-intervention measures are presented below the diagonal. Scale reliabilities are represented by Cronbach's alpha coefficient in the last column.

During the 7-week self-compassion intervention, participants listened to the podcasts an average of 12.57 times per week for a total listen time of 868 minutes ($M = 124$ minutes per participant). Overall, participants listened to 63% of the podcasts' duration ($M = 9:35$ minutes; see Table 2.3).

Table 2.3

Self-Compassion Intervention Adherence

	Podcast Length (mins)	Listen Frequency (Total)	Listen Time (Total)	Listen Time (M)	Percentage Listened (M)
Week 1	21	19	196	10:19	48%
Week 2	24	15	123	8:11	49%
Week 3	20	10	107	10:41	51%
Week 4	20	14	184	13:08	65%
Week 5	18	10	99	9:56	49%
Week 6	15	16	132	8:15	51%
Week 7	5	4	27	6:40	100%
Total M	17.57	12.57	124	9:35	63%

Separate 2 (group) x 2 (time) RM ANOVAs with Bonferroni correction examined the effect of the self-compassion intervention on changes in self-compassion, the TPB constructs, and self-reported PA from pre- to post-intervention between the groups (see Table 2.4). There was

not a statistically significant group x time interaction for self-compassion, $F(1, 18) = .02, p = .90$, or significant main effects for time, $F(1, 18) = .28, p = .61$, or group, $F(1, 18) = 1.70, p = .21, g = -.42$ [95% CI = -3.13, 2.29]. There was not a significant group x time interaction for attitude, $F(1, 18) = .08, p = .78$. Nor were there significant main effects for time, $F(1, 18) = 1.91, p = .18$, or group, $F(1, 18) = 1.89, p = .19, g = .49$ [95% CI = -.41, 1.38]. There was not a significant group x time interaction for subjective norm, $F(1, 18) = 1.93, p = .18$, or significant main effects for time, $F(1, 18) = .60, p = .45$, or group, $F(1, 18) = 4.27, g = 1.08$ [95% CI = .14, 2.02]. There was not a significant group x time interaction for PBC, $F(1, 18) = .42, p = .52$, or significant main effects for time, $F(1, 18) = 2.02, p = .17$, or group, $F(1, 18) = 2.84, p = .11, g = .62$ [95% CI = -.28, 1.52]. There was not a statistically significant group x time interaction for intention, $F(1, 18) = .09, p = .76$. Nor were there significant main effects for time, $F(1, 18) = 2.62, p = .12$, or group, $F(1, 18) = .68, p = .42, g = .27$ [95% CI = -.61, 1.16].

There was not a statistically significant group x time interaction for self-reported PA, $F(1, 18) = .79, p = .39$. Nor were there significant main effects for time, $F(1, 18) = .51$, or group, $F(1, 18) = .50, p = .49, g = .49$ [95% CI = -.40, 1.38]. Lastly, there were also not significant differences between groups for total PA minutes during D2M, $F(1, 18) = 2.15, p = .16, g = -.63$ [-1.53, .27]. There were also no significant group differences during week 1, $F(1, 18) = .82, p = .38, g = -1.24$ [-2.20, -.27]; week 2, $F(1, 18) = .47, p = .50, g = -.94$ [-1.86, -.01]; week 3, $F(1, 18) = .25, p = .63, g = -.68$ [-1.58, .23]; week 4, $F(1, 18) = 1.32, p = .27, g = -1.56$ [-2.57, -.56]; week 5 $F(1, 18) = 3.98, p = .06, g = -2.72$ [-3.93, -1.50]; week 6, $F(1, 18) = .73, p = .41, g = -1.16$ [-2.11, -.21]; or week 8, $F(1, 18) = 2.19, p = .16, g = -2.02$ [-3.10, -.94]. However, there was a significant group difference for PA minutes during week 7, $F(1, 18) = 5.55, p = .03, g = -3.21$

[-4.54, -1.88] with the attention control group reporting more minutes of PA ($M = 443.33$, $SD = 68.74$) than the treatment group ($M = 224.91$, $SD = 62.19$; see Table 2.5).

Table 2.4

Means and Standard Deviations for Self-Compassion, TPB Constructs, and Physical Activity by Group

Variable		Treatment ($n = 11$)		Attention Control ($n = 9$)		Effect Size ($n = 20$)
		M	SD	M	SD	Hedges' g
SCS-12	Pre	3.07	0.83	3.44	0.64	-.42
	Post	3.17	0.73	3.51	0.55	
ATT	Pre	6.61	0.40	6.17	0.96	.49
	Post	6.39	0.90	5.84	1.27	
SN	Pre	5.45	1.11	5.11	0.97	1.08
	Post	5.64	1.20	4.47	0.79	
PBC	Pre	6.34	0.82	5.78	0.92	.62
	Post	6.11	1.34	5.17	1.57	
INT	Pre	6.61	0.66	6.30	1.11	.27
	Post	6.00	2.10	5.41	2.03	
GLTEQ	Pre	44.64	24.61	41.33	21.2	.49
	Post	49.64	18.29	40.78	16.08	

* Groups significantly different, $p < .05$

Note: SCS-12 = self-compassion short-form-12; ATT = attitude; SN = subjective norm; PBC = perceived behavioral control; INT = intention; GLTEQ = Godin Leisure-Time Exercise Questionnaire.

Table 2.5

Average Minutes of Physical Activity During D2M by Group

Variable	Treatment (<i>n</i> = 11)		Attention Control (<i>n</i> = 9)		Effect Size (<i>n</i> = 20)
<i>MapMyRun</i> Minutes	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>Hedges' g</i>
Week 1	290.45	69.27	384.11	76.58	-1.24
Week 2	283.18	58.66	343.22	64.85	-.94
Week 3	258.91	63.39	305.78	70.09	-.68
Week 4	241.09	64.07	350.67	70.84	-1.56
Week 5	172.00	47.32	312.67	52.32	-2.72
Week 6	225.73	65.62	309.11	72.54	-1.16
Week 7*	224.91	62.19	443.33	68.75	-3.21
Week 8	224.45	60.16	357.22	66.51	-2.02
Total	1920.7273	1137.53	2806.1111	1564.20	-.63

* Groups significantly different, $p < .05$

Discussion

Physical inactivity is associated with several chronic diseases, various cancers, and psychological disorders (Alwan, 2011; Reiner, Niermann, Jekauc, & Woll, 2013). Adults struggle to engage in the recommended levels of PA due to failure to self-regulate behavior, but theory-based interventions may improve self-regulation of PA (Carver & Scheier, 2001; Marcus & Forsyth, 2003). A recent systematic review of health behavior interventions found interventions incorporating self-compassion training improved healthy behavior regulation as effectively as other behavioral techniques (Biber & Ellis, 2017); however, to date, self-compassion training has not been applied to PA behavior. Therefore, the purpose of this study was to test the effects of self-compassion training on self-compassion, TPB constructs, and PA behavior among university employees who were participating in a workplace PA program (D2M). There were no significant differences between the treatment and attention control groups for changes in self-compassion, TPB constructs, or self-reported PA from pre- to post-intervention or for minutes of PA during D2M; however, a small sample size limited statistical power and made it difficult to draw conclusions.

Because self-compassion training improves the self-regulation of health behaviors, it was hypothesized that the treatment group would record significantly greater total minutes of PA during D2M than the attention control group (Biber & Ellis, 2017; Sirois, 2015). Although there was not a statistically significant group difference, contrary to the hypothesis, the moderate effect size indicated the control group reported greater PA by more than one half a standard deviation when compared to the treatment group, which was approximately 100 more minutes of PA per week. Participants in the treatment group may have found it difficult to adhere to both the D2M program (participating in and self-monitoring of PA) and the self-compassion training. A recent

meta-analysis found that initiating a mindfulness program like self-compassion training is often perceived as overwhelming (Wyatt et al., 2014). Therefore, it is possible that participants in the treatment group struggled to self-regulate the self-compassion training and PA participation simultaneously, whereas, the participants in the attention control group may have engaged in greater PA during D2M because they did not experience conflict in choosing between two behaviors to self-regulate. Additionally, the length of the self-compassion intervention may have further complicated the treatment group's ability to self-regulate PA. The length of mindfulness training sessions can be a major barrier to adherence, with shorter practices preferred and perceived as more achievable (Banerjee, Cavanagh, & Strauss, 2017; Moore & Martin, 2015; Wyatt, Harper, & Weatherhead, 2014). Although more than 62% of the treatment group participants opened the self-compassion podcast each week and listened to an average of 63% of each podcast, which is better than previous mindfulness-based interventions (Cavanagh et al., 2013; Davidson et al., 2003; Spijkerman, Pots, & Bohlmeijer, 2016), the combination of struggling to self-regulate two behaviors over a 7-week period could explain why the attention control group performed significantly greater PA during D2M. Therefore, future intervention implementation should examine the impact of shorter self-compassion interventions for increasing PA participation. Previous self-compassion interventions were effective with full completion of the training each week (Neff & Germer, 2013). Shorter self-compassion podcasts and/or interventions could result in completion of the self-compassion training, leading to greater effectiveness for PA (Albertson et al., 2015).

Additionally, it was hypothesized that the treatment group would report significantly greater changes in self-reported PA behavior from pre- to post-intervention compared to the attention control group. There was not a statistically significant interaction or main effects, and the

difference between groups at post-intervention was small. Previous self-compassion interventions have significantly improved the self-regulation of other health behaviors when compared to control groups (Adams & Leary, 2007; Biber & Ellis, 2017; Ivanova, Yaakoba-Zohar, Jensen, Cassoff, & Knäuper, 2016; Kelly & Carter, 2014, Kelly et al., 2010); however, self-regulation of health behaviors is more effective when individuals create personally meaningful goals and self-monitor their progress towards those goals (Baumeister & Vohs, 2007). Although weekly tips delivered to all D2M participants addressed goal-setting, the self-compassion podcasts delivered to the treatment group participants did not require them to set their own PA goals. Previous self-compassion interventions with greater adherence and significant improvements in self-compassion asked participants to modify self-compassion training in a personal way (Finlay-Jones, Kane, & Rees, 2016). The self-compassion intervention in this study may have been more effective if participants had set personal and meaningful PA goals and if the self-compassion training was tailored to PA. Despite these results, it is important to note that participants in both groups engaged in the recommended amount of PA (USDHHS, 2008) with an average of more than 150 minutes of moderate-to-vigorous PA per week. This is consistent with previous years of D2M in which participants engaged in more than the recommended levels of PA during program implementation (Biber & Ellis, 2016).

Self-compassion is positively related to feelings of connectedness, the desire to please significant others, positive affect, self-efficacy, and health behavior intention (Neff, 2003a, Neff et al., 2007; Sirois et al., 2015); therefore, it was hypothesized that the treatment group would report significantly greater changes in self-compassion, attitude, subjective norm, PBC, and intention from pre- to post-intervention when compared to the attention control group. Again, there were no statistically significant interactions or main effects for any of these constructs and the

group differences at post-intervention for self-compassion, attitude, and intention were small. The results for self-compassion were contrary to the hypothesis and previous self-compassion interventions (Biber & Ellis, 2017; Kelly & Carter, 2014; Neff & Germer, 2013) and indicated self-compassion training made little impact on PA attitude and intention. However, the moderate and large group differences for PBC and subjective norm, respectively at post-intervention suggest possible differences between the treatment and attention control groups.

These results are promising because this was the first study to examine the impact of self-compassion training on the TPB constructs and PA behavior. Self-compassion training helps individuals become more mindful of personal experiences and enhances feelings of interconnectedness, thus counteracting perceived isolation (Neff, 2003a; Neff et al., 2007a). Interconnectedness can be compared to subjective norm of the TPB, providing a rationale for the large difference between the treatment and attention control group for subjective norm at post-intervention. Furthermore, self-compassion is positively related to self-efficacy, which is often likened to PBC of the TPB (Akin & Akin, 2015; Manavipour & Saeedian, 2016; Sirois, 2015). Self-compassion may improve feelings of control to successfully engage in PA, which may explain the moderate difference between groups in post-intervention PBC (Sirois, 2015). Although the TPB scores for both the treatment and attention control group decreased from baseline to follow-up, the baseline TPB scores were very high. With such extreme scores and a small sample size, TPB scores may have regressed to the mean at follow-up to be closer to the population (Bland & Altman, 1994). Furthermore, PA was significantly correlated with attitude, PBC, and PA intention, which is in line with the hypotheses of the TPB (Ajzen, 1991; Symons Downs & Hausenblas, 2005). Continued testing of the TPB with a larger sample size and a validated self-compassion intervention is warranted, particularly in light of the contradictory findings associated with self-compassion

(Ajzen, 2002; Neff & Germer, 2013; Raes, Pommier, Neff, & Van Gucht, 2010). Altogether, it is difficult to rectify these opposing findings, but perhaps participants in the treatment group were exposed to enough of the self-compassion training to foster greater attitudes, beliefs, perceptions, and motivations towards PA than those in the control group, but not enough to create greater self-compassion.

Although this was the first study to examine the impact of self-compassion training on the TPB constructs and PA, there were several additional limitations beyond sample size that may have impacted the results. First, PA was measured indirectly using self-reported assessments including a mobile application (*MapMyRun*) and the GLTEQ. Although these instruments are valid methods for measuring PA (Biber & Ellis, *in progress*; Gionet & Godin, 1989; Godin & Shephard, 1985), adults tend to over-report PA on questionnaires when compared to direct measurements with accelerometers (Slootmaker, Schuit, Chinapaw, Seidell, & Van Mechelen, 2009; Wick, Faude, Schwager, Zahner, & Donath, 2016). Therefore, future researchers should examine the effectiveness of self-compassion training on the self-regulation of PA using direct assessments.

Another limitation was selection bias. Most of the study volunteers were from departments that had previously participated in D2M, so it is likely they were more active and/or possessed stronger attitudes and motivation towards PA than non-volunteers. This is likely the case given that participants in both groups reported very high scores on the TPB constructs before and after the program. In addition, there may have been departments with previous training in meditation or self-compassion that would make individuals more likely to volunteer for this study. Although volunteers were assigned to the study groups based on department affiliations and groups were balanced according to the department's prior D2M participation, prior experience with

self-compassion training was not taken into consideration and this bias impacts the generalizability of the results.

Lastly, the participants were randomized to either the treatment or attention control group based on their department's previous D2M participation and demographics. There were no significant differences between the two groups at baseline for outcome variable scores, indicating the effectiveness of the randomization process and that the groups were balanced. However, there was a possible difference at baseline for age that was not detected. Future intervention research could randomize participants to either the treatment or attention control group to achieve true randomization. Future researchers should recruit individuals with varied PA histories and control for experience with mindfulness programs. In addition, previous self-compassion interventions targeting health behavior regulation were implemented with clinical samples in which participation was mandatory as a part of treatment (Gale, Gilbert, Read, & Goss, 2014; Kelly & Carter, 2014; Kelly, Carter, & Borairi, 2014). Future implementation could use a three-group design with adequate power to compare self-compassion, attention control, and non-participant groups at baseline and follow-up to understand the impact of self-compassion training on a voluntary sample.

Conclusions

This was the first study to examine the impact of self-compassion training on PA motivation and behavior. This study did not reveal statistically significant differences between the self-compassion and attention control groups in self-compassion, TPB constructs, or PA motivation and behavior. The main limitation of this study was the small sample size limited the statistical power of the study. The inability to recruit more D2M participants for the self-compassion intervention may be related to the idea previously mentioned about the difficulty of self-regulating

multiple behaviors during D2M. Therefore, further research is needed to test the effectiveness of self-compassion training for the self-regulation of PA with a larger sample size and without the conflict of regulating multiple behaviors. The main strength of this study was the first examination of the impact of a self-compassion intervention on the TPB constructs and PA. Although the results were not statistically significant, this pilot study provided feedback and guidance for future self-compassion training within a PA intervention. The adherence to the self-compassion intervention was high, indicating the feasibility of an online self-compassion intervention in a workplace physical activity program. The variety of psychological, emotional, and self-regulatory benefits from self-compassion training is well documented (Biber & Ellis, 2017; Magnus, Kowalski, & McHugh, 2010; Neff, 2003a; Neff et al., 2007a; Neff, Hsieh, & Dejitterat, 2005). Self-compassion training should continue to be researched in the context of PA motivation and behavior in online and face-to-face settings. Increasing participant sample size, recruiting a heterogeneous sample, testing the impact of a shorter self-compassion podcast, and tailoring the self-compassion training to PA is recommended. A deeper understanding of the relationship between self-compassion and PA initiation and adherence is needed.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 179-211.
- Ajzen, I. (2002). Constructing a TPB questionnaire: Conceptual and methodological considerations.
- Akin, A., & Akin, U. (2015). Investigating predictive role of self-compassion on social self-efficacy. *Journal of Educational & Instructional Studies in the World*, 5(3).
- Albertson, E. R., Neff, K. D., & Dill-Shackleford, K. E. (2015). Self-compassion and body dissatisfaction in women: A randomized controlled trial of a brief meditation intervention. *Mindfulness*, 6(3), 444-454.
- Alwan, A. (2011). *Global status report on noncommunicable diseases 2010*: World Health Organization.
- American Heart Association. (2013). Heart disease and stroke statistics – 2013 update: A report from the American Heart Association. *Circulation*, 127, 21-23. doi: 10.1161/CIR.0b013e31828124ad
- Banerjee, M., Cavanagh, K., & Strauss, C. (2017). A Qualitative Study with Healthcare Staff Exploring the Facilitators and Barriers to Engaging in a Self-Help Mindfulness-Based Intervention. *Mindfulness*, 1-12.
- Baumeister, R. F., & Heatherton, T. F. (1996). *Self-regulation failure: An overview. Psychological Inquiry*, 7, 1–15.
- Baumeister, R. F., & Vohs, K. D. (2007). Self-regulation, ego depletion, and motivation. *Social and Personality Psychology Compass*, 1, 1-14.

- Biber, D. D. & Ellis, R. (2016). A RE-AIM evaluation of a team-based physical activity program for university employees. *International Journal of Sports Studies*, 6(2), 90-94.
- Biber, D. D. & Ellis, R. (2017). The effect of self-compassion on the self-regulation of health behaviors: A systematic review. *Journal of Health Psychology* (3), 1-12.
- Bland, J. M., & Altman, D. G. (1994). Statistics notes: some examples of regression towards the mean. *BMJ*, 309(6957), 780.
- Bureau of Labor Statistics U.S. Department of Labor. (2011). The employment situation – September 2011. <http://www.bls.gov/news.release/pdf/empsit.pdf>. Accessed 14 September 2011.
- Carver, C. S., & Scheier, M. F. (1981). Attention and self-regulation: A control-theory approach to human behavior. New York, NY: Springer-Verlag.
- Carver, C. S., & Scheier, M. F. (2001). On the self-regulation of behavior. Cambridge University Press.
- Cavanagh, K., Strauss, C., Cicconi, F., Griffiths, N., Wyper, A., & Jones, F. (2013). A randomised controlled trial of a brief online mindfulness-based intervention. *Behaviour Research and Therapy*, 51(9), 573-578.
- CDC Division of Nutrition, Physical Activity, and Obesity. National Center for Chronic Disease Prevention and Health Promotion. Data and Statistics. 2014; <http://www.cdc.gov/physicalactivity/data/facts.htm>. Accessed August 15, 2015.
- Davidson, R. J., Kabat-Zinn, J., Schumacher, J., Rosenkranz, M., Muller, D., Santorelli, S. F., ... & Sheridan, J. F. (2003). Alterations in brain and immune function produced by mindfulness meditation. *Psychosomatic Medicine*, 65(4), 564-570.

- Dishman, R. K., & Buckworth, J. A. N. E. T. (1996). Increasing physical activity: a quantitative synthesis. *Medicine and Science in Sports and Exercise*, 28(6), 706-719.
- Ellis, R., Kosma, M., & Symons Downs, D. (2013). Moderators of youth exercise intention and behavior. *Health Education & Behavior*, 40(3), 305-310.
- Finlay-Jones, A., Kane, R., & Rees, C. (2016). Self-Compassion Online: A Pilot Study of an Internet-Based Self-Compassion Cultivation Program for Psychology Trainees. *Journal of Clinical Psychology*, 00(0), 1-20.
- Friis, A. M., Johnson, M. H., Cutfield, R. G., & Consedine, N. S. (2016). Kindness matters: a randomized controlled trial of a mindful self-compassion intervention improves depression, distress, and HbA1c among patients with diabetes. *Diabetes Care*, 39(11), 1963-1971.
- Gale, C., Gilbert, P., Read, N., & Goss, K. (2014). An evaluation of the impact of introducing compassion focused therapy to a standard treatment programme for people with eating disorders. *Clinical Psychology & Psychotherapy*, 21(1), 1-12.
- Gilson, N., McKenna, J., Cooke, C., & Brown, W. (2007). Walking towards health in a university community: a feasibility study. *Preventive Medicine*, 44(2), 167-169.
- Gionet, N. J., & Godin, G. (1989). Self-reported exercise behavior of employees: a validity study. *Journal of Occupational Medicine.: Official Publication of the Industrial Medical Association*, 31(12), 969-973.
- Godin, G., & Shephard, R. (1985). A simple method to assess exercise behavior in the community. *Canadian Journal of Applied Sport Sciences*. (10), 141-146.
- Hedges, L. and Olkin, I. (1985) *Statistical Methods for Meta-Analysis*. New York: Academic Press.

- Ivanova, E., Yaakoba-Zohar, N., Jensen, D., Cassoff, J., & Knäuper, B. (2016). Acceptance and Commitment Therapy and Implementation Intentions Increase Exercise Enjoyment and Long-Term Exercise Behavior Among Low-Active Women. *Current Psychology*, 35(1), 108-114.
- Kelly, A. C., & Carter, J. C. (2014). Self-compassion training for binge eating disorder: A pilot randomized controlled trial. *Psychology and Psychotherapy: Theory, Research and Practice*.
- Kelly, A. C., Carter, J. C., & Borairi, S. (2014). Are improvements in shame and self-compassion early in eating disorders treatment associated with better patient outcomes?. *International Journal of Eating Disorders*, 47(1), 54-64.
- Kline, R. B. (2010). *Principles and practices of structural equation modeling* (3rd ed.). New York: Guilford Press.
- Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: A practical primer for t-tests and ANOVAs. *Frontiers in Psychology*, 4, 863, 1-12.
- Linke, S. E., Gallo, L., C., & Norman, G. J. (2011). Attrition and adherence rates of sustained vs. intermittent exercise interventions. *Annals of Behavioral Medicine*, 42(2), 197-209.
- Magnus, C. M., Kowalski, K. C., & McHugh, T. L. F. (2010). The role of self-compassion in women's self-determined motives to exercise and exercise-related outcomes. *Self and Identity*, 9(4), 363-382.
- Manavipour, D., & Saeedian, Y. (2016). The role of self-compassion and control belief about learning in university students' self-efficacy. *Journal of Contextual Behavioral Science*, 5(2), 121-126.
- Marcus, B. H., & Forsyth, L. (2003). *Motivating people to be physically active*. Human Kinetics.

- Moore, K. M., & Martin, M. E. (2015). Using MBCT in a chronic pain setting: a qualitative analysis of participants' experiences. *Mindfulness*, 6(5), 1129–1136.
- Neff, K. (2003a). The development and validation of a scale to measure self-compassion. *Self and Identity*, 2, 223–250. doi:10.1080/15298860309027
- Neff, K. (2003b). Self-Compassion: An Alternative Conceptualization of a Healthy Attitude Toward Oneself. *Self and Identity*, 2, 85–101. doi:10.1080/15298860309032
- Neff, K. D. (2011). Self-compassion, self-esteem, and well-being. *Social and Personality Compass*, 5, 1-12.
- Neff, K. D. & Davidson, O. (2016). Self-compassion: Embracing suffering with kindness. In I. Ivztan & T. Lomas (Eds.), *Mindfulness in Positive Psychology* (pp. 37-50). Rutledge.
- Neff, K. D., & Germer, C. K. (2013). A pilot study and randomized controlled trial of the Mindful Self-Compassion Program. *Journal of Clinical Psychology*, 69, 28–44.
- Neff, K., Hsieh, Y., & Dejitterat, K. (2005). Self-compassion, achievement goals, and coping with academic failure. *Self and Identity*, 4, 263–287.
- Neff, K. D., Kirkpatrick, K. & Rude, S. S. (2007a). Self-compassion and its link to adaptive psychological functioning. *Journal of Research in Personality*, 41, 139-154.
- Raes, F., Pommier, E., Neff, K. D., & Van Gucht, D. (2011). Construction and factorial validation of a short form of the Self-Compassion Scale. *Clinical Psychology & Psychotherapy*, 18, 250–255.
- Reiner, M., Niermann, C., Jekauc, D., & Woll, A. (2013). Long-term health benefits of physical activity—a systematic review of longitudinal studies. *BMC Public Health*, 13(1), 813.

- Sirois, F. M. (2015). A self-regulation resource model of self-compassion and health behavior intentions in emerging adults. *Preventive Medicine Reports*, 2, 218-222.
- Sirois, F. M., Kitner, R., & Hirsch, J. K. (2015). Self-compassion, affect, and health-promoting behaviors. *Health Psychology*, 34(6), 661.
- Slootmaker, S. M., Schuit, A. J., Chinapaw, M. J., Seidell, J. C., & Van Mechelen, W. (2009). Disagreement in physical activity assessed by accelerometer and self-report in subgroups of age, gender, education and weight status. *International Journal of Behavioral Nutrition and Physical Activity*, 6(1), 1.
- Spijkerman, M. P. J., Pots, W. T. M., & Bohlmeijer, E. T. (2016). Effectiveness of online mindfulness-based interventions in improving mental health: A review and meta-analysis of randomised controlled trials. *Clinical Psychology Review*, 45, 102-114.
- Symons Downs, D., Graham, G. H., Yang, S., Bargainnier, S., & Vasil, J. (2006). Youth exercise intention and past exercise behavior: Examining the moderating influences of sex and meeting exercise recommendations. *Research Quarterly for Exercise and Sport* 77(1), 91-99.
- Symons Downs, D., & Hausenblas, H.A. (2005). The theories of reasoned action and planned behavior applied to exercise: A meta-analytic update. *Journal of Physical Activity and Health*, 2, 76-97.
- Terry, M., Leary, M., & Mehta, S. (2013). Self-compassionate reactions to health threats. *Personality and Social Psychology Bulletin*, 39(7), 911–926.
- U.S. Department of Health and Human Services. (2008). Physical activity guidelines for Americans. <http://www.health.gov/PAGuidelines/>. Accessed 11 Jan 2011.
- Wick, K., Faude, O., Schwager, S., Zahner, L., & Donath, L. (2016). Deviation between self-reported and measured occupational physical activity levels in office employees: effects of

age and body composition. *International Archives of Occupational and Environmental Health*, 89(4), 575-582.

Wyatt, C., Harper, B., & Weatherhead, S. (2014). The experience of group mindfulness-based interventions for individuals with mental health difficulties: a meta-synthesis. *Psychotherapy Research*, 24(2), 214–228.

Yarnell, L. M., Stafford, R. E., Neff, K. D., Reilly, E. D., Knox, M. C., & Mullarkey, M. (2015). Meta-analysis of gender differences in self-compassion. *Self and Identity*, 14(5), 499-520.

APPENDICES

Appendix A

Demographic Questionnaire

Part 1 Instructions. Please write or check the answer that best matches your response to each statement below.

DATE _____ PANTHER ID # _____ (this is required to match survey responses)		
1. AGE _____ 2. HEIGHT _____ ft _____ in 3. CURRENT WEIGHT _____ lbs		
4. GENDER: _____ Male _____ Female	5. RACE/ETHNICITY: _____ White or Caucasian _____ Black or African American _____ Hispanic or Latino _____ Asian _____ Native Hawaiian or Pacific Islander _____ Multiracial _____ Other	6. HIGHEST LEVEL OF EDUCATION: _____ Less than 9 TH Grade _____ Some high school, no degree _____ High school graduate/GED _____ Some college, no degree _____ Associate's degree _____ Bachelor's degree _____ Graduate or professional degree
7. EMPLOYEE STATUS: _____ Graduate Assistant _____ Staff _____ Faculty _____ Administration	8. DEPARTMENT AFFILIATION: _____ Athletics _____ CEHD Office of the Dean _____ Counseling and Psych Services _____ Honors College _____ Hospitality Administration _____ Human Resources _____ Kinesiology and Health _____ Nutrition _____ Physical Therapy _____ Police Department _____ Psychology _____ Public Health _____ Recreational Services _____ Student Health Promotion Services _____ Undergraduate University Advisement	9. PERSONAL ANNUAL INCOME: _____ Less than \$10,000 _____ \$10,000-\$14,999 _____ \$15,000-\$24,999 _____ \$25,000-\$49,999 _____ \$50,000-\$99,999 _____ \$100,000-\$149,999 _____ \$150,000-\$199,999 _____ \$200,000 or more

Appendix B

Self-Compassion Scale Short-Form

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

- | Almost
never | | | | | Almost
always | | | |
|-------------------------|-----|---|--|----------|--------------------------|----------|--|----------|
| 1 | | 2 | | 3 | | 4 | | 5 |
| _____ | 1. | When I fail at something important to me I become consumed by feelings of inadequacy. | | | | | | |
| _____ | 2. | I try to be understanding and patient towards those aspects of my personality I don't like. | | | | | | |
| _____ | 3. | When something painful happens I try to take a balanced view of the situation. | | | | | | |
| _____ | 4. | When I'm feeling down, I tend to feel like most other people are probably happier than I am. | | | | | | |
| _____ | 5. | I try to see my failings as part of the human condition. | | | | | | |
| _____ | 6. | When I'm going through a very hard time, I give myself the caring and tenderness I need. | | | | | | |
| _____ | 7. | When something upsets me I try to keep my emotions in balance. | | | | | | |
| _____ | 8. | When I fail at something that's important to me, I tend to feel alone in my failure. | | | | | | |
| _____ | 9. | When I'm feeling down I tend to obsess and fixate on everything that's wrong. | | | | | | |
| _____ | 10. | When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people. | | | | | | |
| _____ | 11. | I'm disapproving and judgmental about my own flaws and inadequacies. | | | | | | |
| _____ | 12. | I'm intolerant and impatient towards those aspects of my personality I don't like. | | | | | | |

Appendix C

TPB Questionnaire

Instructions. The following questions are about your **current physical activity behavior**. Using the definition of regular physical activity provided below, choose the answer that most appropriately answers the statement for you by **circling a number on the 7-point scale**.

<p>Regular physical activity includes an accumulation of at least 150 minutes of moderate intensity activity per week <i>or</i> an accumulation of at least 75 minutes vigorous intensity activity per week (or a combination of both). Moderate-intensity activities raise your heart rate and make you break a sweat, yet you are still able to carry on a conversation. Vigorous-intensity activities largely increase your breathing and heart rate, and conversation is difficult or broken. Such physical activities include walking (with or without crutches, canes, braces, or prostheses), jogging, wheeling, ball games (e.g., doubles and/or singles tennis, softball, basketball, golf without a cart), swimming, cycling, arm cranking, dancing, and other similar activities. Activities that are primarily sedentary, such as bowling, playing golf with a cart, and passive stretching, are NOT considered regular physical activity.</p>									
<p>1. Most people who are important to me</p> <p style="text-align: center;">DO 1 2 3 4 5 6 7 DO NOT</p> <p style="text-align: center;">participate in regular physical activity.</p>									
<p>2. If you are really motivated, participating in regular physical activity is</p> <p style="text-align: center;">VERY MUCH 1 2 3 4 5 6 7 NOT AT ALL</p> <p style="text-align: center;">beyond your control?</p>									
<p>3. For me, participating in regular physical activity is</p> <p style="text-align: center;">USELESS 1 2 3 4 5 6 7 USEFUL</p>									
<p>4. I try to participate in regular physical activity.</p> <p style="text-align: center;">STRONGLY DISAGREE 1 2 3 4 5 6 7 STRONGLY AGREE</p>									
<p>5. For me, participating in regular physical activity is</p> <p style="text-align: center;">INTERESTING 1 2 3 4 5 6 7 BORING</p>									
<p>6. Most people who are important to me think</p> <p style="text-align: center;">I SHOULD 1 2 3 4 5 6 7 I SHOULD NOT</p> <p style="text-align: center;">participate in regular physical activity.</p>									
<p>7. If you are really motivated, how confident are you that you can participate in regular physical activity?</p> <p style="text-align: center;">NOT CONFIDENT AT ALL 1 2 3 4 5 6 7 COMPLETELY</p> <p style="text-align: center;">CONFIDENT</p>									

8. For me, participating in regular physical activity is	HARMFUL	1	2	3	4	5	6	7	BENEFICIAL
9. I intend to participate in regular physical activity.	STRONGLY DISAGREE	1	2	3	4	5	6	7	STRONGLY AGREE
10. For me, participating in regular physical activity is	PLEASANT	1	2	3	4	5	6	7	UNPLEASANT
11. Most people who are important to me participate in regular physical activity.	STRONGLY DISAGREE	1	2	3	4	5	6	7	STRONGLY AGREE
12. I plan to participate in regular physical activity.	STRONGLY DISAGREE	1	2	3	4	5	6	7	STRONGLY AGREE
13. If you are really motivated, participating in regular physical activity is	EASY	1	2	3	4	5	6	7	DIFFICULT
14. For me, participating in regular physical activity is	GOOD	1	2	3	4	5	6	7	BAD
15. Most people who are important to me want me to participate in regular physical activity.	STRONGLY DISAGREE	1	2	3	4	5	6	7	STRONGLY AGREE
16. If you are really motivated, how much personal control do you feel you have over participating in regular physical activity?	VERY LITTLE CONTROL	1	2	3	4	5	6	7	COMPLETE CONTROL
17. For me, participating in regular physical activity is	WISE	1	2	3	4	5	6	7	FOOLISH
18. For me, participating in regular physical activity is	UNENJOYABLE	1	2	3	4	5	6	7	ENJOYABLE

Appendix D

Godin Leisure Time Exercise Questionnaire

Instructions. This is a scale that measures your leisure-time exercise (i.e., exercise that was done during your free time). Considering a 7-day period (**typical week**), please indicate how often, on the average, you did the following kinds of exercise for more than **10 minutes** during your **free time**.

<p>Strenuous exercise: (heart beats rapidly)</p> <p>(e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling, aerobic dance classes, heavy weight training)</p>	<p>How many times per typical week did you perform strenuous exercise for 10 minutes or longer during your free time?</p>	<p>_____</p>
<p>Moderate exercise: (not exhausting, light sweating)</p> <p>(e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)</p>	<p>How many times per typical week did you perform moderate exercise for 10 minutes or longer during your free time?</p>	<p>_____</p>
<p>Mild exercise: (minimal effort, no sweating)</p> <p>(e.g., easy walking, yoga, archery, fishing, bowling, lawn bowling, shuffleboard, horseshoes, golf, snow mobiling)</p>	<p>How many times per typical week did you perform mild exercise for 10 minutes or longer during your free time?</p>	<p>_____</p>

Godin, G., & Shephard, R. J. (1985). A simple method to assess exercise behavior in the community. Canadian Journal of Applied Sport Science, 10, 141-146.

Appendix E

Volunteer Recruitment Email

Recruitment Email to Desire2Move (D2M) Participants from Team Captain

Dear Team Members,

Dr. Rebecca Ellis, coordinator of the D2M physical activity challenge, is looking for volunteers to participate in a self-compassion mindfulness meditation program during the 8-week competition for research purposes. Volunteers will also be asked to sign a consent form, listen to the self-compassion podcasts, and fill out a questionnaire before and after the program. Research volunteers will be asked to listen to a 20-minute self-compassion podcast at least once per week and as much as once per day for seven weeks. Participants can access the podcast via email on their computer or mobile device. If you are interested in learning more about this opportunity or are interested in participating in this research study, please contact her at rellis@gsu.edu or 404-413-8370.

Appendix F

Consent Form

Georgia State University
Department of Kinesiology and Health
Waiver of Documentation of Consent

Title: *The Effect of a Mindful Self-Compassion Intervention on University Employee Physical Activity Motivation and Behavior*

Principal Investigator: Rebecca Ellis, PhD

Student Principal Investigator: David Biber, MS

Student Investigator: Ashlee Hamilton, MS

I. PURPOSE:

You are invited to participate in a research study. The purpose of this study is to investigate the exercise motivation and behavior of Georgia State University employees. The goal is to learn how self-compassion influences exercise. Self-compassion is the kindness you show yourself in a difficult situation. We invite you to participate because you are a Georgia State University employee participating in Desire2Move (D2M).

This study is asking for 96 participants. Participation is different depending on which group you are placed in (see below).

II. PROCEDURES:

If you decide to participate, you will fill out questionnaires. Questionnaire participation time will be 15 minutes. You will then be put into the self-compassion group or the MapMyRun group for the remainder of the study.

Self-Compassion Group:

Participation will require you listen to a different self-compassion podcast at least once per week for seven weeks of the D2M program. The self-compassion podcasts are 5 minutes to 20 minutes in length requiring 123 minutes of your time over the course of D2M. You will also log your daily minutes of physical activity on the MapMyRun website or smartphone application asking for a minimum of 10 minutes per day, four times a week for eight weeks (320 minutes total minimum). Total participation will take a total of 8 hours of your time over the course of eight weeks.

You will receive the following electronic questionnaires:

- **Personal History Questionnaire.** This asks about age, gender, race and/or ethnicity, education, income, employment status, and department affiliation, as well as self-reported height and weight.
- **Physical Activity Questionnaire.** This asks information about the physical activity you have done, how often you are physically active, and how long you do physical activity.
- **Exercise Motivation Questionnaires.** This asks about factors that influence your motivation to be physically active.

- **Self-Compassion Questionnaire.** This measures your level of self-compassion.

After the first week of Desire2Move (D2M), you will be emailed a self-compassion podcast once a week for seven weeks. You will be asked to listen to it at least once a week and ideally, once a day. You will log your daily minutes of physical activity for eight weeks. At the end of D2M, the student PI will email you a link to the following questionnaires:

- **Physical Activity Questionnaires.** This asks information about the physical activity you have done, how often you are physically active, and how long you do physical activity.
- **Exercise Motivation Questionnaires.** This asks about factors that influence your motivation to be physically active.
- **Self-Compassion Questionnaire.** This measures your level of self-compassion.

MapMyRun Group:

Participation will require you log your daily minutes of physical activity on the MapMyRun website or smartphone application. You will also log your daily minutes of physical activity on the MapMyRun website or smartphone application asking for a minimum of 10 minutes per day, four times a week for eight weeks (320 minutes total minimum). Questionnaire participation will take a total of 30 minutes. Total study participation over eight weeks will be six hours.

You will receive the following electronic questionnaires:

- **Personal History Questionnaire.** This asks about age, gender, race and/or ethnicity, education, income, employment status, and department affiliation, as well as self-reported height and weight.
- **Physical Activity Questionnaire.** This asks information about the physical activity you have done, how often you are physically active, and how long you do physical activity.
- **Exercise Motivation Questionnaires.** This asks about factors that influence your motivation to be physically active.
- **Self-Compassion Questionnaire.** This measures your level of self-compassion.

You will log your daily minutes of physical activity for eight weeks. At the end of D2M, the student PI will email you a link to the following questionnaires:

- **Physical Activity Questionnaires.** This asks information about the physical activity you have done, how often you are physically active, and how long you do physical activity.
- **Exercise Motivation Questionnaires.** This asks about factors that influence your motivation to be physically active.
- **Self-Compassion Questionnaire.** This measures your level of self-compassion.

III. RISKS:

In this study, you will not have any more risks than you would in a normal day of life. There are no risks involved in responding to the questionnaires beyond what participants would encounter during a normal day. Physical activity, however, does provide a small degree of risk for negative responses that include sore muscles, dizziness, nausea, fatigue, heightened blood pressure, heart attack, stroke, and in rare instances death. The most recent statistics suggest that one in four hundred thousand hours of moderate-intensity exercise, among high-risk participants, results in negative responses requiring medical attention. Participants for this self-compassion study volunteered for the D2M program and as part of that program

are encouraged to participate in moderate-to-vigorous activities they feel comfortable performing. This study will not prescribe any physical activity, but rather will simply monitor self-selected physical activity using MapMyRun; therefore, this research study poses minimal risk to participants.

IV. BENEFITS:

Participation in this study has the potential to benefit participants personally. Regular participation in physical activity can improve cardiovascular and respiratory function, reduce coronary artery disease risk factors, and decrease morbidity and mortality. Regular physical activity can help participants mentally by lowering levels of anxiety and depression. Physical activity can also increase quality of life and enhance feelings of well-being. Improving self-compassion can also improve quality of life, self-esteem, behavior self-regulation, reduce anxiety, and depression. However, participation in this study will not have any positive or negative effect on participants' employment at Georgia State University. We hope that the results of this project will help us improve the D2M program at Georgia State University that could potentially improve the overall health and well-being of employees if they choose to participate in future D2M programs.

V. VOLUNTARY PARTICIPATION AND WITHDRAWAL:

Participation in research is voluntary. You do not have to be in this study. If you decide to be in the study and change your mind, you have the right to drop out at any time. You may skip questions or stop participating at any time. Whatever you decide, you will not lose any benefits to which you are otherwise entitled. Your participation or withdrawal from the research will not affect you in any way.

VI. CONFIDENTIALITY:

We will keep your records private to the extent allowed by law. Dr. Rebecca Ellis and members of the research team will have access to the information you provide. Information may also be shared with those who make sure the study is done correctly [GSU Institutional Review Board, the Office for Human Research Protection (OHRP)]. We will use a participant ID number rather than your name on study records so we can match your questionnaires from the pre-assessment to the post-assessment. Only the research team will have access to the questionnaires and all data will be password protected. This will help protect privacy. Your identifying information will not appear when we present this study or publish its results. The findings will be summarized and reported in group form. You will not be identified personally.

VII. CONTACT PERSONS:

You can contact Dr. Rebecca Ellis (404-413-8370 or rellis@gsu.edu) or David Biber (404-413-8110 or dbiber2@gsu.edu) if you have questions, concerns, or complaints about this study. You can also call if you think you have been harmed by the study. Call Susan Vogtner in the Georgia State University Office of Research Integrity at 404-413-3513 if you want to talk to someone who is not part of the study team. You can also email her at svogtner1@gsu.edu. You can talk about questions, concerns, offer input, obtain information, or suggestions about the study. You can also call Susan Vogtner if you have questions or concerns about your rights in this study.

VIII. COPY OF CONSENT FORM:

If requested, we will email you a copy of this consent form if you desire.

Appendix G

Self-Compassion Intervention Description

The first week of self-compassion meditation is the Affectionate Breathing Meditation (21 minutes). This meditation asks participants to find a comfortable position, notice all bodily sensations, and release tension through the breath. Participants bring *kind* attention to the burdens they are carrying let them go through exhaling. As the participant lets their body breathe them, they are instructed to notice how nourishing their breath can be, soothing them without effort. Participants gently savor and appreciate the stillness of their body.

The second week of self-compassion meditation is the Compassionate Body Scan (24 minutes). Participants lie flat on their back in a comfortable position, noticing the warmth of their breath. Participants then progress their attention to through every individual part of their body, noticing the sensations and bringing compassion to any area with negative or uncomfortable sensations. Next participants are asked to bring gratitude to each individual body part (ex. Thank your feet for holding your body up all day long). With compassion and gentleness, every area of the body is recognized and appreciated with kindness and respect.

The third week of self-compassion meditation is the Loving-Kindness Meditation (20 minutes). Participants find a comfortable position, focusing on the breath with loving awareness. Participants bring to mind a being that naturally makes them smile and brings happiness to them, enjoying the good company. Participants recognize that this being wishes to be happy and free from suffering, and repeats the hope, “May you be safe, may you be peaceful, may you be healthy, may you live with ease.” Participants then add themselves to this mantra by replacing “you” with “we”. Participants then let go of the image of the loved being, and focus their atten-

tion on their own goodwill and happiness by replacing “we” with “I”. With final breaths, the participant offers themselves other kind and loving words they may wish to hear from others, savoring the compassion that flows from their heart.

The fourth week of self-compassion meditation is the Self-Compassion/Loving Kindness Meditation (20 minutes). This meditation helps the participant become aware and in touch with their physical bodily sensations, bringing a sense of compassion and peace to their body. Participants will notice physical and emotional stress and bring an understanding that every human experiences stress. Participants give themselves goodwill, kindness, and compassion in their time of stress. Participants repeat, “May I be safe, may I be peaceful, may I be kind to myself, may I accept myself as I am,” as a form of affection and care. This helps the participant foster self-compassion for a personal experience of suffering or difficulty.

The fifth week of self-compassion meditation is the Noting Your Emotions Meditation (18 minutes). This will help participants become aware of various emotions they feel and experience, and treat or release them with self-compassion.

The sixth week of self-compassion meditation is the Soften, Soothe, Allow: Working with Emotions in the Body Meditation (15 minutes). Participants find a comfortable position, close their eyes, and take three deep, relaxing breaths, bringing kindness to themselves. Participants recall and mild-moderately difficult situation they are currently in, visualizing the stressful situation, who was there, what was said, and what happened. They name the strongest most difficult emotion associated with the situation (ex. Anger, grief, fear, etc.). Participants repeat the emotion in a soothing, soft tone, as if validating for a friend what the emotion he or she is feeling. Participants then recall the situation again and scan their entire body for where they feel the

emotion most. Then, participants are to soften that location of the body, letting the muscles release and become soft, increasing awareness of the emotion rather than trying to remove the sensation. Participants then soothe themselves for struggling in such a way, recognizing the emotion and experience and offering words of encouragement and compassion. Finally, participants are to allow the discomfort to be present, abandoning the wish for it to disappear. Participants are to repeat the mantra, “soften, soothe, and allow,” when this or other similar stressful situations arise.

The seventh week of self-compassion meditation is the Self-Compassion Break (5 minutes). Participants search their body and mind for stress and say to them, “This is a moment of suffering.” This is mindfulness. Participants then acknowledge that, “Suffering is a part of life.” This is common humanity. Participants follow with deep breathing and a gentle touch of their hands over the heart. Participants then say, “May I be kind to myself,” asking what they personally need to hear from themselves, whether it is compassion, acceptance, forgiveness, strength, peace, etc.